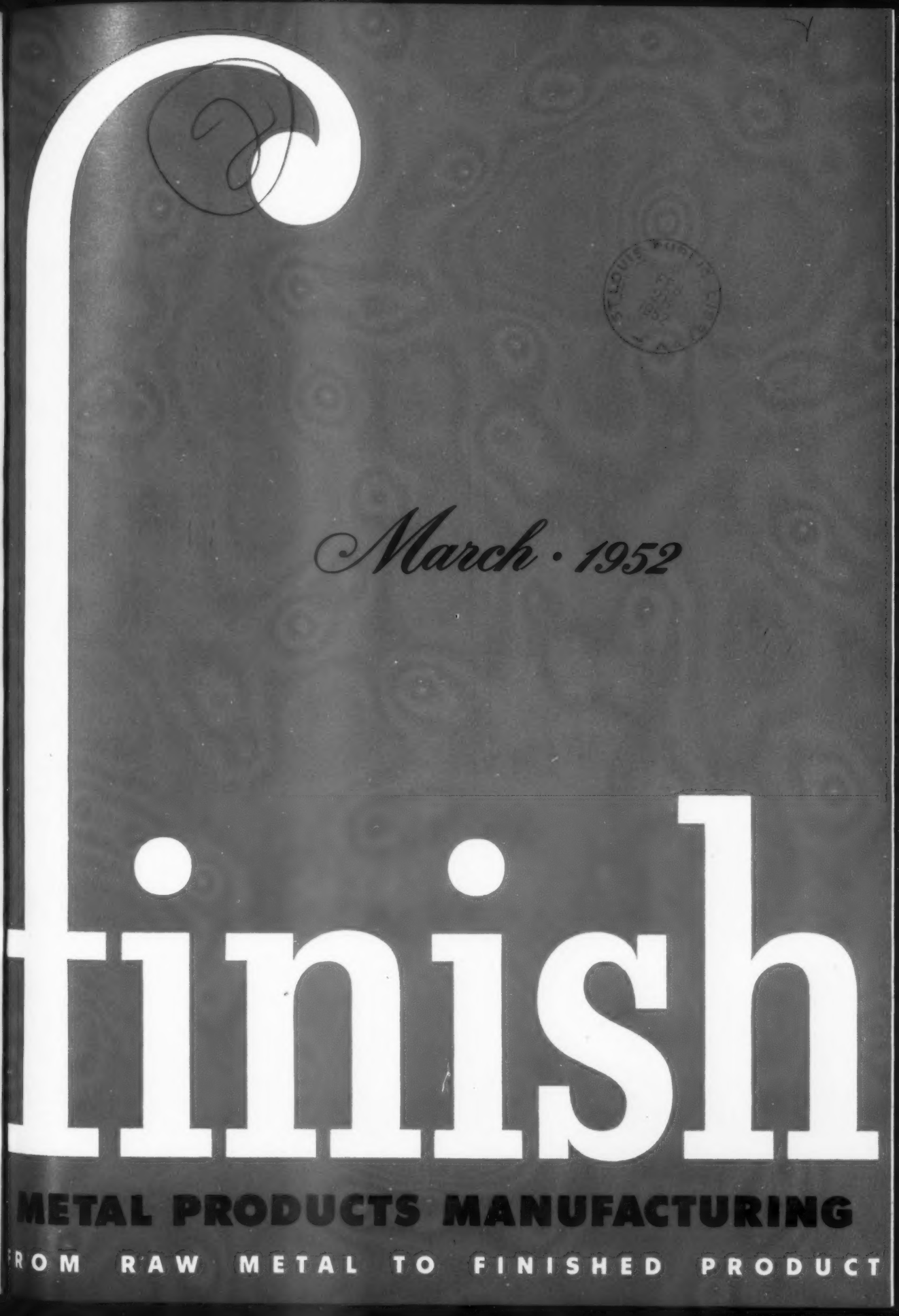
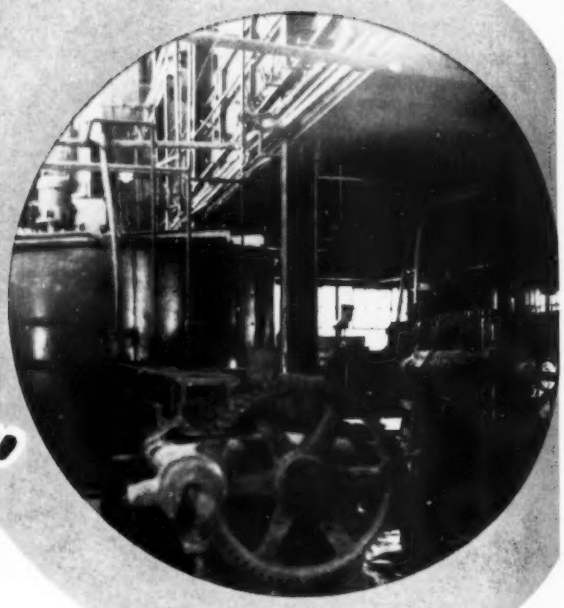

March · 1952
finish
METAL PRODUCTS MANUFACTURING
FROM RAW METAL TO FINISHED PRODUCT

no shortage.....in the quality

Each step in the manufacture of "Ceramic" Colors and Chemicals is guarded in this control laboratory.

you get from "Ceramic"



One of "Ceramic's" complete chemical units, each capable of producing large quantities of material.

WHATEVER shortages exist or may arise, there will be no shortage in "Ceramic" Quality. The same rigid controls as in normal times are being employed in our chemical laboratory. Test batches are fired under production conditions that duplicate your own. You can put full confidence in "Ceramic" colors and chemicals, for true-to-sample matching, for trouble-free workability.

Every effort is being made to supply the needs of those who have depended on us in the past. "Ceramic" is actively engaged in testing and processing available material for conversion into usable products. If you have a problem which our experience and specialized laboratory and testing equipment can help solve, you can count with confidence on our full cooperation.

WENNING CERAMIC COLORS TRADE MARK

CERAMIC COLOR & CHEMICAL MFG. CO.
New Brighton, Pa., U.S.A.

ADS OUT

It's as easy as this . . .

FOR *Real Host* GAS RANGES

Out of our carton

Into your door

Another range with a PERMA-VIEW window. It is the product of Harry C. Weiskittel Co., Inc., Baltimore.

PERMA-VIEW

. . . THE WINDOW YOU CAN SEE THROUGH *Always*

The easy, economical method of offering "visible baking" as a sales feature for your range is to use PERMA-VIEW oven door windows.

The strong steel encased, double pane PERMA-VIEW window incorporates the finest quality heat resisting glass. It is mechanically sealed to prevent infiltration of vapors and to keep the window "clear" permanently.

PERMA-VIEW is the fastest growing feature in the range field today. We can work with your engineering department and you can offer this feature on ***your*** range in a very short time. Call or write today.

MILLS ENGINEERING COMPANY

3683 EAST WILLIS DETROIT-7-MICHIGAN

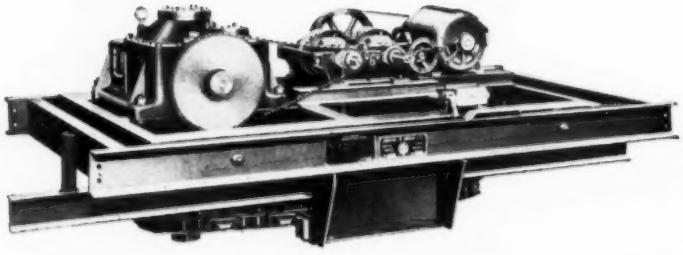
The FIRST Flying Carpet

was "FLOATED" by an Old Caliph in Bagdad

He mentioned it frequently in his famous Tales of the "Thousand and One Nights." Since then "air space" has been put into use for many mechanical devices . . .

Not a floating carpet — but a powerful pulling "work-horse" for conveyor systems is the

FLOATING DRIVE with AUTOMATIC CUT-OFF and LOAD INDICATOR



another FIRST by JERVIS B. WEBB COMPANY

For years a standard on Webb Conveyor systems, the patented Floating Caterpillar Drive enables automatic limit switch cut-off in case of jam, cushions starting load, and has an easily seen calibrated load indicator.

The motivating power unit on both the Caterpillar and Sprocket type Webb drives floats on wheels against heavy springs. When a conveyor starts, the initial shock is taken by these springs.

If external forces jam the conveyor, the springs are compressed to a point where the moving frame actuates a limit switch on the fixed frame, stopping the drive instantaneously. As soon as the jam is eliminated, the conveyor may be started immediately by push button. There are no shear pin headaches. If a conveyor becomes overloaded, this fact is indicated at once as the compressor springs move an arrow indicator to a red danger area.

CONVEYOR ENGINEERS AND MANUFACTURERS

JERVIS B. WEBB COMPANY

8913 ALPINE AVE. DETROIT 4, MICH.

OFFICES IN PRINCIPAL CITIES

FACTORIES IN DETROIT . . . LOS ANGELES . . . HAMILTON, ONT.

MEETINGS

TOOL ENGINEERS EXPOSITION

American Society of Tool Engineers, annual industrial exposition, International Amphitheatre, Chicago, March 17-21.

PRESSED METAL INSTITUTE

Pressed Metal Institute, spring technical meeting, Hotel Carter, Cleveland, O., March 20-21.

WORLD TRADE FAIR

International Trade Fair, Navy Pier, Chicago, March 22 through April 6.

EEI SALES CONFERENCE

Edison Electric Institute, annual sales conference, Edgewater Beach Hotel, Chicago, March 31-April 3.

NAT'L PACKAGING EXPOSITION

American Management Association, national packaging exposition and conference, Atlantic City Auditorium, April 1-4.

AMERICAN CERAMIC SOCIETY

The American Ceramic Society, annual meeting, William Penn Hotel, Pittsburgh, April 27-May 1.

INT'L LIGHTING EXPOSITION

The 4th International Lighting Exposition and Conference, Cleveland Auditorium, Cleveland, Ohio, May 6-9.

GAS APPLIANCE MFRS. MEETING

Gas Appliance Manufacturers Association, 17th annual meeting, The Broadmoor, Colorado Springs, Colorado, May 21-23.

ELECTROPLATERS MEETING AND FINISHING EXPOSITION

American Electroplaters Society, 39th annual convention, Conrad Hilton Hotel, and concurrent Industrial Finishing Exposition of 1952, International Amphitheatre, Chicago, June 16-20.

ADS OUT

"...and they'll look like new for years to come!"

To keep home appliances new-looking longer, porcelain enamel finish is the answer. And among porcelain enamels, thin coat titania enamels—with no sacrifice of opacity—possess those properties which are most suitable for appliance use: greater shock, abrasion and chemical resistance.

TITANOX-TG, non-pigmentary titanium dioxide, is specially processed for all ceramic formulations. Through its controlled chemical and physical composition, TITANOX-TG assures unvarying color uniformity, speeds production and lowers cost. TITANOX-TG-400 is especially useful where characteristic delicate blue-white tints are desired.

Titanox Technical Service is always available to assist you with frit formulation problems. Ask your Titanox representative or write Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

9663

® TITANOX

the brightest name in ceramics

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

AMERICAN CHEMICAL PAINT COMPANY
AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet
Subject: RUST PROOFING WITH PERMADINE®

INTRODUCTION:

Ferrous metal parts that have been Permadized in a zinc phosphate chemical solution and then "sealed" with a rust-preventive oil such as "Granoleum" are effectively protected from rust-damage. In addition, if the surface is accidentally chipped or scratched, rusting is confined to the exposed area.

Rust proof coatings find many practical applications. During World Wars I and II most small arms were rust proofed by phosphate coating and impregnated with chromic acid and a rust preventive oil, or cutback petrolatum. This not only provided excellent corrosion resistance but also yielded a dull black non-reflecting surface. Rust proof finishes are now used widely on hardware, firearms, cartridge clips, metallic belt links, miscellaneous forgings and castings, tools, unpainted replacement machine parts, and many other similar items such as bolts, nuts, and washers.

THE PERMADIZING PROCESS:

For the most effective rust proofing of large or small work in large or small production, "Permadine" is used in tanks in an immersion process, with the bath heated to 190°-210°F., coating time 20 to 30 minutes. The coated parts are then rinsed in clean water, and then in a controlled dilute acidulated solution. After drying, a suitable corrosion-resistant oil such as "Granoleum" is applied.

Operations can be carried out with the work in crates, or hung from hooks, utilizing an overhead rail and hoists. For large volume production, automatic equipment can be used to mechanize the line. Small parts can be treated in tumbling barrels.

"PERMADINE" MEETS SERVICE SPECIFICATIONS:

The protective "Permadine" finish meets U.S.A. 57-0-2C; Type II, Class B, and equivalent requirements of:

MIL-C-16232,
Type II
U.S.A. 51-70-1,
Finish 22.02, Class B
AN-F-20
Navy Aeronautical M-364
JAN-L-548

"PERMADINE" DATA CHART

Type of coating	Zinc phosphate
Object of coating	Rust and corrosion prevention
Typical products treated	Nuts, bolts, screws, hardware items, tools, guns, cartridge clips, fire control instruments, metallic belt links, steel aircraft parts, certain steel projectiles and many other components
Scale of production	Large or small volume; large or small work
Method of application	Dip Barrel tumbling, racked or basketed work
Equipment notes	Immersion tanks of suitable capacity. Cleaning and rinsing stages can be of mild steel. Coating stage can be of heavy mild steel or stainless steel.
Chemicals required	"Permadine" No. 1
Pre-cleaning methods	Any common degreasing method can be used. Alkali cleaning ("Ridosol"), Acid cleaning ("Deoxidine"), Emulsion-alkali cleaning ("Ridosol"-"Ridoline"); vapor degreasing, solvent wiping, etc., are examples. Acid cleaning may need to follow other cleaning methods if rust or scale is present.
Bath Temperature	190° - 210°F.
Coating time	20 - 30 minutes
Coating weight range Mgs./Sq. Ft.	1000 - 4000
Technical Service Data Sheets	No. 7-20-1-2 T. M. No. 5

CHEMICALS ACP PROCESSES

WRITE FOR FURTHER INFORMATION ON "PERMADINE" AND YOUR OWN METAL PROTECTION PROBLEMS

CHEMICALS ACP PROCESSES

From the Editor's mail...

Hot-tinning process

Gentlemen:

In the near future we will be installing equipment for the hot-tinning of our metal stamped parts. We are interested in obtaining some literature concerning the techniques and problems of this tinning process. Who may we contact or where may such reading material be obtained?

John M. Robinson
A. J. Knott Tool & Mfg. Corp.
Milford, Massachusetts

any *finish* readers who have information on this tinning process are invited to write directly to Mr. Robinson.

Interesting subjects

Gentlemen:

I want to compliment you on the continuing growth and very interesting subjects which you publish monthly. It is certainly a big improvement on the early editions, and I hope your publication will continue to grow and be a credit to the industry it serves.

N. R. Klein
Chairman of the Board
Caloric Stove Corporation
Topton, Pennsylvania

thank you, Mr. Klein. Your comment is appreciated.

Scientific developments

Gentlemen:

I have watched the growth of *finish* over the years, and have always been impressed with the high character of its industry reporting, both in news as well as scientific developments. You certainly deserve all of the many compliments that you have received for giving porcelain finishing and now other types of finishing a real trade publication.

I am impressed with the increased volume of advertisements that you carry, having sold space many years

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PAINT-MISER®

PROVES FAR SUPERIOR IN ACTUAL TEST

Hamilton Manufacturing Company

Two Rivers, Wisconsin

December 6, 1951

Ashdee Products, Inc.
18029 Dixie Highway
Homewood, Illinois

Gentlemen:

After investigating numerous finishing processes a little over a year ago, we decided on yours mostly because we felt it had all of the advantages of any automatic process plus some features not found in others. The fact that your unit uses 110 volt A.C. input, does not require endless royalty payments, finishes parts supported on simple work holders, and covers sheared edges satisfactorily without excessive build up were the deciding points.

Now after a little over six months of operation on a production line using well over 100 gallons of paint per day, we find results very pleasing. Material savings of at least 35% and labor savings of over 60% have been our experience. Furthermore, the amount of reinforcing required on recessed areas is so small that we have only one spray operator for this work and he uses less then 15% of the total amount of paint used in the whole system.

We feel that your unit has done everything expected and do not hesitate to recommend it to others.

Very truly yours,

HAMILTON MANUFACTURING COMPANY

F. A. Goraki

F. A. Goraki
Material Research Division

FAG:LM

Manufacturers of { AUTOMATIC CLOTHES DRYERS • WOOD AND STE
ENGINEERS, DENTISTS, PHYSICIANS, CHEMISTS, NURSERI

Read what this Prominent Paint-Miser User says... —Then Compare This Performance Against your Present Equipment

"NO ENDLESS ROYALTY PAYMENTS"

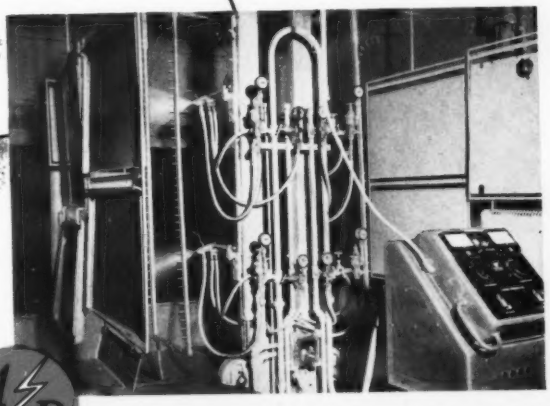
"LABOR-SAVINGS OF OVER 60%"

"MATERIAL SAVINGS OF AT LEAST 35%"

"WITHOUT EXCESSIVE BUILD-UP ON EDGES"

"RESULTS VERY PLEASING"

"RECOMMEND IT TO OTHERS"



Hamilton's own words and pictures tell the profit story of Paint-Miser, the modern, electronic paint-spray unit. Find out how you can enjoy these immense savings in your finishing department. Ask us to send a Paint-Miser expert to you. No obligation. Write or wire at once.

ASHDEE PRODUCTS, INC.

18029 Dixie Highway • Homewood, Illinois

PHOTO COURTESY THE YOUNGSTOWN SHEET AND TUBE COMPANY

In this picture, the peel of the charging machine at the left is ready to push a charging box of baled scrap into an open hearth furnace. Overhead is a hot metal ladle used to add molten pig iron after the scrap is melted.

THE finish LINE

THE SCRAP DRIVE IS PROGRESSING in the effort to corral all dormant material (iron, steel, copper, brass, bronze, aluminum, lead and zinc), but any problem as serious and far-reaching as the scrap shortage will not be erased in a few short months.

We shall report just a few developments and examples of progress and then offer a suggestion to all readers of **finish.**

Some production regained in steel

All eight openhearth furnaces of the U. S. Steel Company that went down for lack of scrap early in January have been reopened. *Three* of the five that went down in *Pittsburgh* were restored to active production during the week of January 21. The five remaining furnaces, *two in Pittsburgh and three in Gary, Indiana,* were restored as the month of February opened.

Some examples of aggressive scrap recovery programs

Both the *Trade Association and Business Papers Information Committees* have organized specific programs for the promotion of scrap recovery.

Robert K. Mossman of Jones and Laughlin Steel Company who is scrap coordinator for the *Advertising Council, Inc.,* has advised that space donated by business and trade papers would be valued at more than $450,000 if inserted as paid ads. The total circulation of these publications is 29 million. Mr. Mossman's report on radio and TV allocations covered more than 41 million impressions on radio and 6,993,000 impressions on TV.

New 2-color scrap poster "Get in the Scrap" in sizes 14″ x 20″ and 20″ x 28″ were ready for distribution during week of February 18, by Commerce-NPA key field offices.

Steel Founder's Society of America distributed series of direct mail folders, each carrying a pertinent scrap story, to 25,000 executives in the metals field. In addition, scrap stickers were sent to all members of the industry for use on outgoing mail.

The Automotive Engineer Rebuilders Association, with headquarters in Indianapolis, has a membership of about a thousand. Its slogan: "If you can't rebuild it, scrap it."

The *Aluminum Company of America,* supporting a program to flush out all critically needed nonferrous scrap, is placing a series of sizeable advertisements in trade publications. The size of the advertisement is 9″ x 14″ and *reprints for shop bulletins and charts are available.* Write to: Advertising Department, Aluminum Company of America, 2171-A Gulf Building, Pittsburgh 19, Pa.

American Gas Association will survey contributions of the gas industry to the nation's scrap pile.

Examples of "sending home the scrap"

Lowe Bros. Company, of Dayton, Ohio, is actively supporting the in-plant recovery program in house organ, IBC News. Frequent surveys are made of all properties and most recent report cited recovery of nearly 30,000 pounds of iron and steel scrap, copper and brass.

Sixteen million pounds of steel scrap and 140,000 pounds of copper and brass have been collected by *Sun Oil Company* in a pilot operation designed to provide guides for the oil industry in similar undertakings.

General Motors collected 12,459 tons of non-production scrap from its plants, suppliers and dealers during one month . . . This is tonnage equivalent of about 550 light tanks . . . since July 1, when GM started its dormant scrap program, nearly *30,000 gross tons* of non-production scrap have been moved.

In December, *Naval installations* over the country sold 20,000 tons. December collection was 150% over June, and average increase for entire period is 97%.

The *Maritime Administration* has released six more floating vessels (52,292 gross tons). Most of these ships were built prior to or shortly after World War I and are not considered serviceable or capable of being made seaworthy again.

Universal Marine Salvage Operators of Chicago are enroute to salvage steel scrap off the Bermuda reefs. A hundred-ton derrick is being towed to the area from Norfolk, Virginia, to salvage eight ships that have been on the bottom for more than 30 years.

The salvage of a 48-year old Pacific cable belonging to the *Commercial Pacific Cable Company* and no longer in use will provide an estimated *3,000 tons of copper* scrap and probably 3 to 4 times as much *lead scrap.* Approximately *10,000 nautical miles of cable* extends on the bottom of the Pacific Ocean to the Far East and is the largest recovery project of copper scrap ever attempted.

Two of Republic Steel Corporation's top salesmen, members of the *Chicago Scrap Committee,* persuaded Lawrence Brasher, master mechanic of the greater yards of Belt Railway, to scrap seven old Baldwin-type locomotives and tenders, a 150 ton coal chute and storage structure. *1,000 tons* of heavy melting scrap are on their way to the mills, plus *43 tons of brass* valves and *copper* tubing.

John C. Blake, of the Phosphor Bronze Corporation of Seymour, Connecticut, has been named *Director* of the *Non-Ferrous Scrap Metal Mobilization Council,* according to T. E. Veltfort, of Copper and Brass Research Association, and Chairman of the new Council. Headquarters are at 205 East 43rd Street, New York City.

"Out of the ears"

A printed box in "Scrap Round Up," publication of O.P.I., states "The continuing active search for scrap — iron, steel, copper, brass, lead, bronze, aluminum and zinc — will hasten the day when controls on scarce metals can be lifted."

If you believe this simple statement to be fact, and are interested in the suggested result, and in helping to promote a continuous flow of metals, then *continue* to do your part in the drive for dormant scrap.

If you are skeptical in your estimate of the O.P.I. statement, then determine to "call the bluff" *and* to keep scrap moving until it is "flowing out of the ears" of steel mills and scrap dealers, and *until* the storage lots of both are *literally* filled.

The job is started, but it is far from finished. Do your part to keep it moving.

Dana Chase

EDITOR AND PUBLISHER

Beseler "Throws Light" ON 50% TIME SAVINGS

How the Charles Beseler Company, Newark, New Jersey, eliminated 84 fasteners and cut assembly time and cost in half on new opaque projector assembly

It used to take 168 screws, nuts and washers to attach the cover panels to the base frame of the new Beseler opaque projector. That was before "U"-Type SPEED NUTS were tried. Now it takes only 84 screws and SPEED NUTS to do this job.

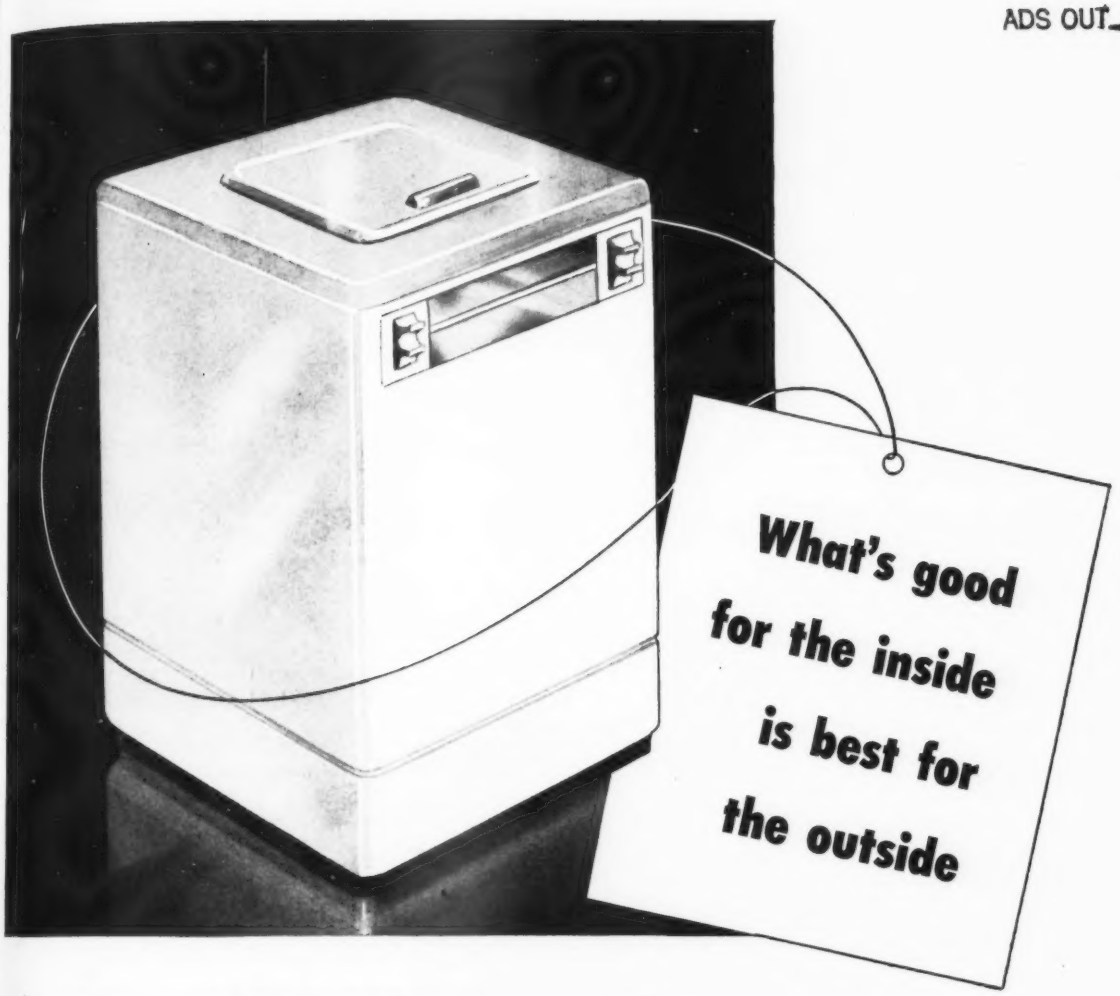
By making this switch, Beseler picked up a 5% material savings, reduced handling, stocking and ordering of parts and made a substantial 50% saving in assembly time.

"U"-Type self-retaining SPEED NUTS are pre-assembled on the base frames of projectors – ready for simple attaching of panels as frames come down assembly line. Time required for this step was cut from 13 minutes to 6, and the production rate was increased to a new high.

There is no better time than now to take a close look at *your* fastening costs. Savings here often balance rising costs elsewhere. Your Tinnerman representative will supply helpful details. Call him in – and write now for your copy of Savings Stories, Vol. III. TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio. In Canada: Dominion Fasteners, Limited, Hamilton. In Great Britain, Simmonds Aerocessories, Limited, Treforest, Wales.

"U"-Type SPEED NUTS are shown on flange of frame – in screw-receiving position, ready for blind attachment of panels. No extra parts handling. Screws are easily inserted and driven from assembly side of projector.
TINNERMAN Speed Nuts®
*Trade Mark Reg. U. S. Pat. Off.
FASTEST THING IN FASTENINGS

ADS OUT



Use U·S·S Vitrenamel— the finest enameling base

● Washing machines are emerging from the basement and taking their place in the modern kitchen or the complete modern laundry. As a result, the housewife wants her machine to have a finish that's just as good-looking, as easy-to-clean, and as durable as her kitchen range. That finish is porcelain-enameled steel. You use it inside the machine to guard against corrosion . . . give the outside the same protection.

Enamelers have found U·S·S Vitrenamel the ideal base material. Its special surface texture promotes maximum adhesion. As a result, the steel is protected against corrosion, and the finished product has a *permanently* beautiful and durable surface.

Make use of the well-known U·S·S Vitrenamel label as an added sales point for porcelain-enameled products made from this quality steel.

U·S·S VITRENAMEL

USS

UNITED STATES STEEL COMPANY, PITTSBURGH: COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

2-197

UNITED STATES STEEL

Curtain walls as related to porcelain enamel

by Joseph N. Lacy • EERO SAARINEN & ASSOCIATES, BLOOMFIELD HILLS, MICHIGAN

LET me try to define "curtain wall". A curtain wall in the sense we refer to is a non-structural exterior wall that is supported by and on the skeleton structure of a building. It is usually thought of as the outside closing wall of a multiple story building.

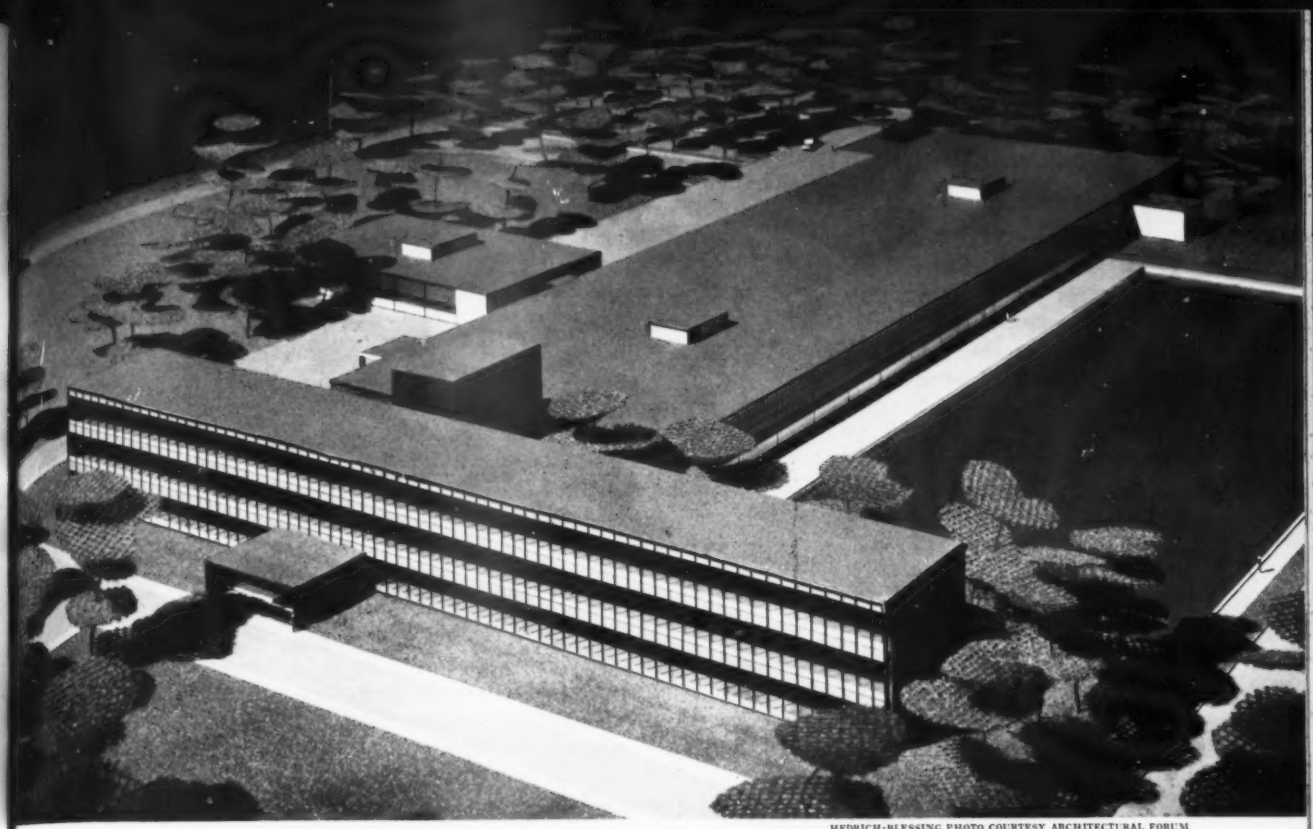
A curtain wall is sort of a structural parasite. It contributes nothing to the structural system insofar as the overall structure is concerned. In fact, it merely adds to the job that the structural frame has to do because the curtain wall is supported by the building framework. You have seen multi-story buildings under construction where the builder starts the exterior finish wall at the second or third floor and the columns and beams of the first floor remain exposed. That is the one clear indication of how the curtain wall relates to the structure. Actually the wall could be started at any floor because the wall is usually supported at each floor level.

Construction progress photo showing glass and panels in place in curtain wall of General Motors Technical Center engineering administration building.

The background of curtain wall construction

Let's look into the history of curtain walls for a minute. Before the latter part of the 19th century the skyscraper was unknown. There were multi-story buildings but such buildings were of the wall-bearing masonry variety, and not very high. In such structures, the walls did all the work and the higher the structure the thicker the walls became on the ground floor. This type of construction reached a climax when a building was built with walls 15 feet thick at the base. Fortunately, iron and steel came into structural usage and the post and beam method of building construction replaced the cumbersome bearing-wall method. This gave us the skeleton structural frame which developed into the skyscraper. The skeleton frame of the skyscraper is enclosed with curtain walls.

As mentioned previously, the curtain wall is a parasite structurally speaking. All it contributes to the



HEDRICH-BLESSING PHOTO COURTESY ARCHITECTURAL FORUM

Photograph of scale model of General Motors Technical Center's engineering building group.

structure is weight. The heavier the curtain wall the more work the structure must perform. The first and obvious reaction to that is, of course, to make the curtain wall as light as possible. Each pound saved in the weight of the curtain wall reduces the amount of "deadload" carried by the structural frame.

Function of the curtain wall— the code problem

What is the function of the curtain wall? Basically it protects the interior from the elements. Therefore we can say that any material capable of doing this would be suitable for use as a curtain wall. But it isn't that easy. We have building codes, the municipal building regulations designed to insure the safety of life and property. The curtain wall comes in for its share of building code regulations.

These regulations have to do principally with fire. Although the curtain wall contains normally about one square foot of glass to three square feet of masonry or other noncombustible material, the building codes require that the wall area other than glass stop fire for as long as four hours in some instances. It is possible to increase the glass area in the curtain wall to as much as 100%. However, it is not possible in most cities *(because of codes)* to use materials in the curtain wall that are equal to or even somewhat better than glass. It is either glass or a two to four-hour wall.

In our development of a curtain wall, we have been fortunate in the fact that the building code did require the high fire rating. In the case of the General Motors Technical Center project, it is located outside the Detroit city limits, and the local community has no building code.

Five years ago we developed a theory about curtain wall design and then set out to locate a product that we could use. We thought of the curtain wall as a three part structure, that is a framework or gird to support windows and spandrel panels. The framework and the windows were no problem. The spandrel panel, the area of exterior wall extending up from the head or top of the window of one floor to the sill of the window of the floor above, however, was a problem. In this area we find the spandrel beam which carries the external edge of the floor slab and the spandrel wall which is that "mystic" fire-stop from the top of the spandrel beam to the window sill.

Four "ground rules" for spandrel panels

It is our belief that the spandrel panel is the key to the whole subject of curtain wall construction. This panel has a very difficult job to perform, and I would like to explain our "ground rules" for such a panel. *First,* it should be as light as possible in order not to pile unnecessary weight onto the structure. *Second,* it should be thin in order not to use valuable floor space. *Third,* it must be weatherproof and have the highest possible thermal insulating value. *Fourth,* it should be flexible as to size of surface area.

We searched far and wide with no results. True, there were several products on the market that could have been used but we found objections to all of them. It began to look like a lost cause and we were pretty discouraged when, like so often happens, we found the answer to our problem so close to us it is hard to understand how we had missed it. A friend and

neighbor who is connected with Chrysler's Cycleweld division was at that time actually making panels of the type we had been trying to find. Chrysler's panels were being made for uses other than for building construction, but we found them readily adaptable to our purpose and we applied them to a structure we were then designing. This structure was a Science Building for Drake University.

The panel used at Drake was good because it gave us a weatherproof, lightweight panel with good thermal insulating qualities but, because of the method of construction then used, there was oil-canning in the metal skins. However, before the next project came along we found the answer to that objection. Chrysler, U. S. Plywood, and others, have a core material that had been developed during the war which made it possible to eliminate the oil-canning problem. This core material is paper honeycomb which will be described later. First, let's describe the General Motors Technical Center on which we used the new panels.

General Motors technical center

In 1945, shortly after World War II, General Motors came to the Saarinen firm to design for them a Technical Center. The Technical Center, in a way, was a result of the war. General Motors had conducted research before the war but the facilities were not centralized. Their functions grew so rapidly in scope and importance during the war that it seemed highly desirable to bring them all together into one group.

We worked on the design for about 18 months, and it was then that we were doing the first research on spandrel panels. You may recall that in 1946 construction prices rose very rapidly. This and other facts brought about the deferment of the project. Late in 1948 the project was continued. However, so many things had happened in two years that it was necessary to start the project from scratch and most of the earlier designs were discarded.

I have just about reached the point in my story where porcelain enamel becomes very important. The curtain wall design on the Technical Center buildings is quite similar to the Drake Science Building. However, the General Motors people know a great deal about sheet metal and they would approve the use of the panels only on two conditions: First that the metal skins be perfectly flat, and second that the panels be colored in lieu of natural aluminum or stainless steel and that the color be permanent. We were reasonably sure that we could fulfill the first point. The second was somewhat different. However, since the only permanent color finish on steel that we knew of was porcelain enamel, we recom-

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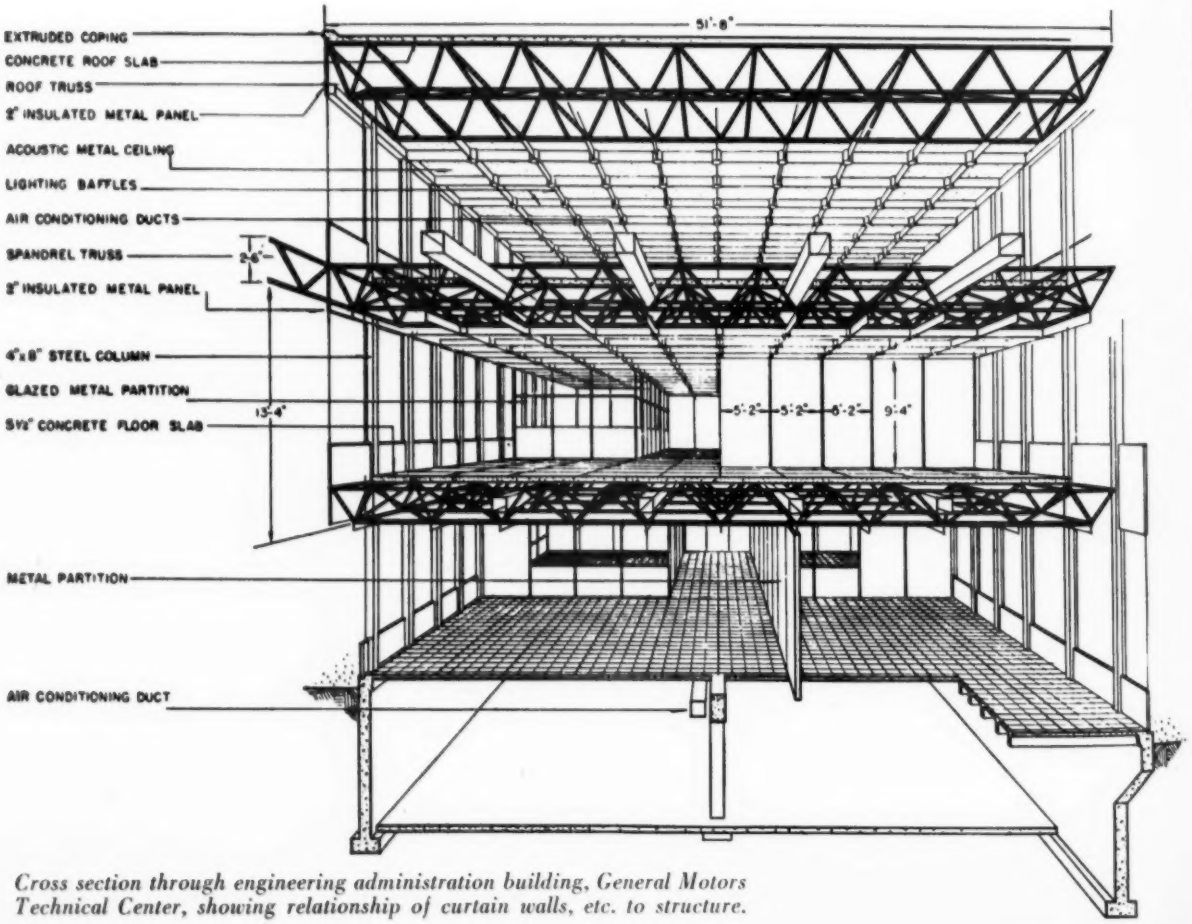


Cross section through engineering administration building, General Motors Technical Center, showing relationship of curtain walls, etc. to structure.

ADS OUT

How stoves and ranges are made in the Pacific Northwest

describing the fabrication, finishing and assembly operations for the production of appliances at Pacific Stove & Foundry

by Howard E. Jackson

finish

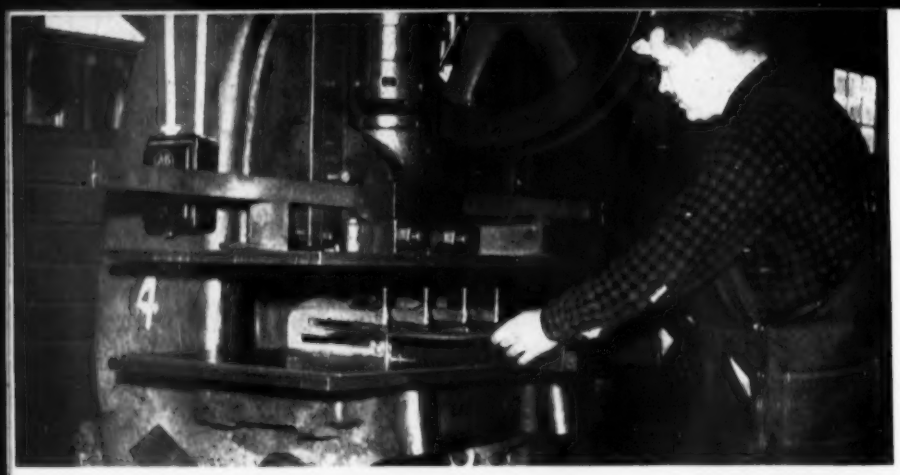
The fire which destroyed the sheet metal assembly building and the paint shop at Pacific Stove & Foundry Company, Seattle, Washington, two years ago was probably a blessing in disguise. It gave management a chance to set up more efficient production, sheet metal-paint-assembly-wise, in two modern fire-proof structures, with walls and ceiling of aluminum and galvanized sheets. These buildings are located side by side so that sheet metal fabricated parts can move out one door into the baked enamel department, then back to assembly. Porcelain enameling operations are in another building which was not destroyed by the fire.

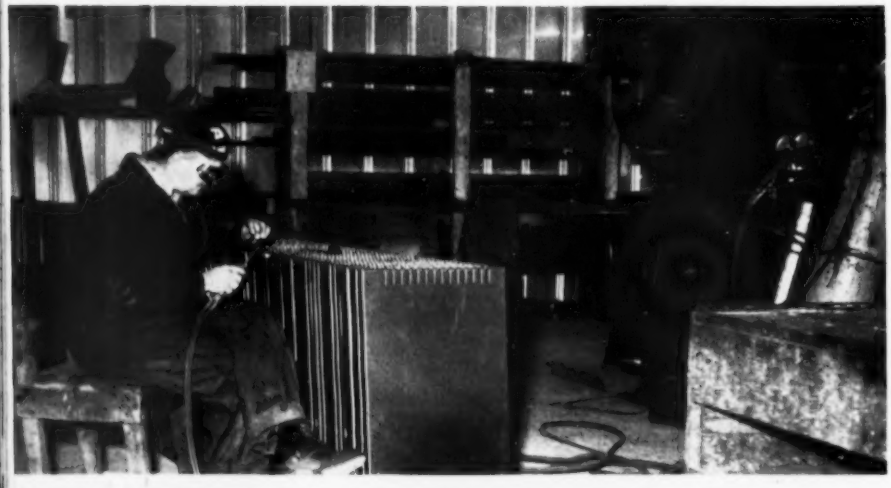
The sheet metal and assembly divisions are housed in a 40 by 180-foot structure. Such compactness is remarkable, considering the number and size of the products turned out. Pacific makes some 20 models of stoves, ranges and heaters including: standard electric domestic ranges, combination electric wood and coal units, wood, coal and oil burning kitchen heaters, wood and coal ranges, oil ranges, wood circulating heaters, cabin cook stoves, camp stoves and oil-burning boat galley stoves. In addition to these items the company also manufactures metal newspaper container tubes, commercial radio hardware and other "outside" products. All parts of the stoves, ranges and heaters are fabricated except elements and switches, wiring and the like.

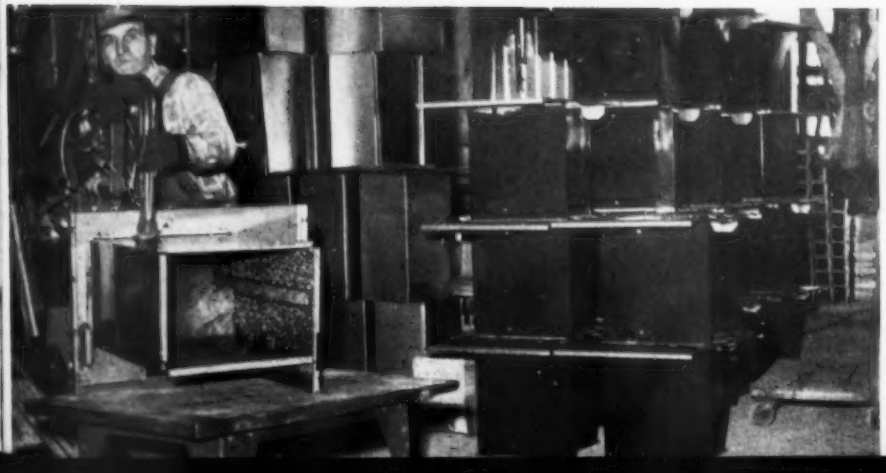
Cast iron parts processing

All grey iron castings — grate bars, linings, top plates, etc. — are made in the company's foundry. These castings then go to the porcelain enameling building for finishing, or directly to assembly — as the case may be. Range tops are polished on two fully automatic table-type polishing machines, each handling pieces up to 48 inches by 72 inches. Auxiliary buffers and smaller equipment are used for special work. Castings are porcelain enameled by standard methods. Cast iron ground coat is fired for approximately 30 minutes

All "heavy" cutting is done on this shear. Sheared pieces are then put on dollies and taken to the head of the press line.







Left: Four holes are punched out on kitchen heater fronts with this special set-up in a punch press.

Upper center: Bending the four sides of kitchen heater doors out of 20 gage enameling steel on a press brake. Note how operator lines up part for gas welding.

Lower center: As many as 400 kitchen heater side panels are stacked on end in a row by the press brakeman. Welder is brought to the work to eliminate parts handling.

Bottom: Here a portable unit welds oven back ends to oil ranges.

---

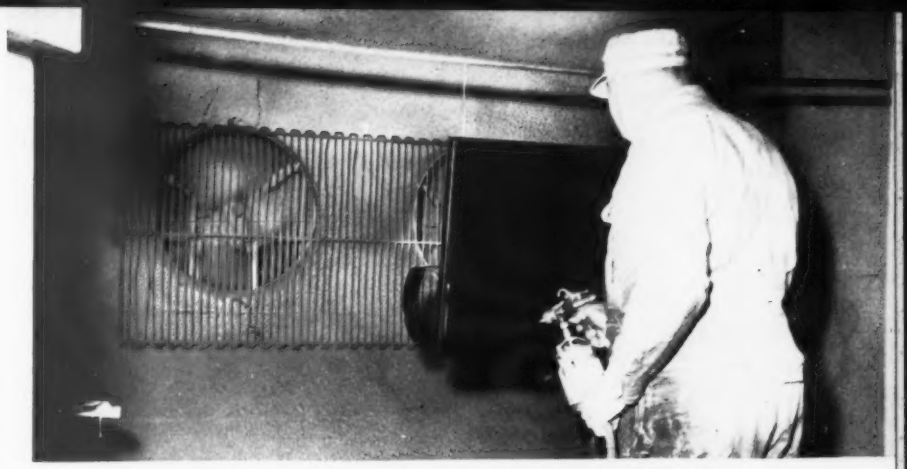
at 1400° F. (according to size of the part). Then castings are given two cover coats. Furnace time varies form 22 to 45 minutes, depending upon the number of decks used in the oven, at 1350° F. Ground coats are dipped, cover coats sprayed. A 5-foot by 12-foot box electric furnace with twin speed forks is used.

Sheet metal fabrication

All top, side, bottom, front and inside panel production takes place in one half of the 40 by 180-foot structure, the other half being devoted to assembly and testing. Hot and cold rolled, and enameling steel is unloaded directly from boxcars spotted on the railroad spur, or from trucks at the door, and placed on platforms along the rear wall. Sheets are fed directly from the platforms into one of two shears. The sheared sheets are then put on dollies and taken to the head of the press line. The various press operations proceed from front to rear down the line.

Most of the line is set up similarly, with platform-type jig and adjustable gages — each press specializing in one operation such as notching, punching holes, etc. After proceeding down the press line the panels end at the power brake. All allied operations, like cutting out inside holes on the nibbler, also feed into the brake. All bending is accomplished here to form the edges.

Kitchen heater side panels and other parts to be acetylene welded are stacked by the brake operator on



Right: All inside parts, backs and bases are painted and baked in the new baked enamel building. Most of these parts are painted black.

Upper center: Stove parts which have been coated with black baking enamel enter the oven on portable hanging racks to be baked for approximately 35 minutes at 275° F.

Lower center: Pouring frit into one of three mills. Standard procedure is followed in making enamel.

Bottom: All porcelain enameled parts are ground coat dipped, then hung above the tank and drip pans that flank it.

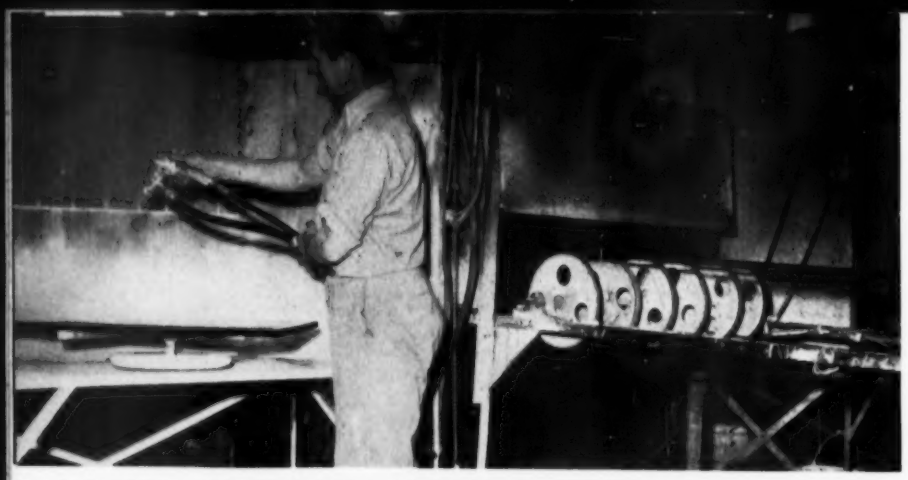
end, in long rows, on each side of the brake, with as many as 400 parts stacked in one row. The welder can go down the row, without ever touching the parts. Letting the operator stack the parts, and by bringing the welder to the work, saves on material handling.

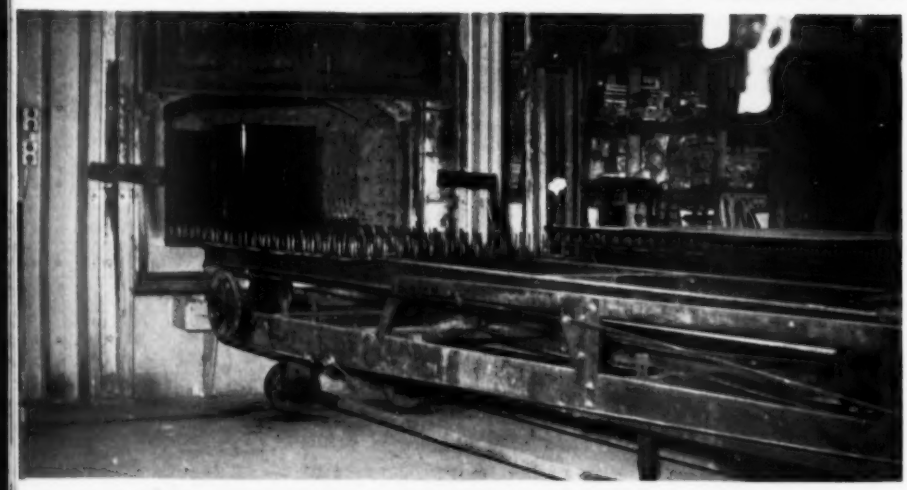
Parts then go directly across the building for sub-assembly by spot welders, or to the baked enamel or porcelain enamel buildings. Both portable and stationary spot welders are used, according to which is most efficient for the particular sub-assembly. Some sub-assemblies will go to one or the other of the finishing buildings, or directly to final assembly adjacent to the spot welding area.

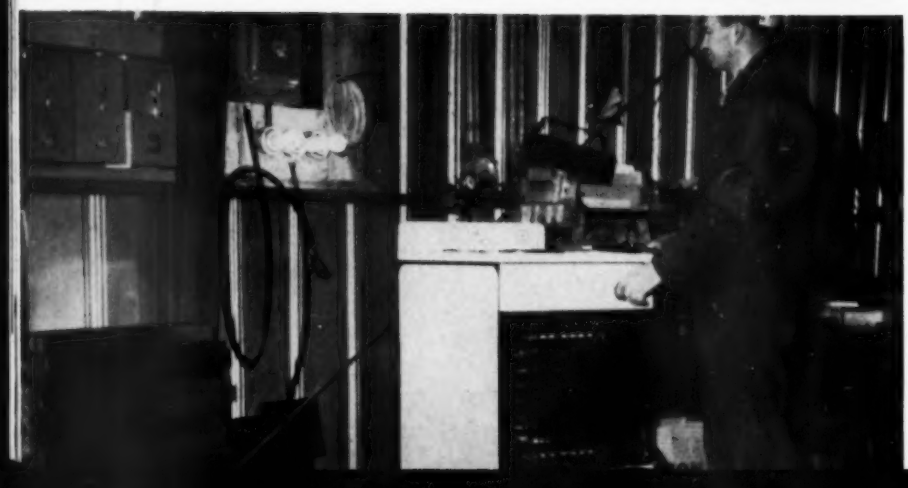
Organic finishing

All inside parts such as vents, backs and bases are painted and baked in the new baked enamel building. Parts range in size from those you can hold on the palm of your hand to those which just fit into the oven. Most stove parts are painted black but circulating heaters are dark brown (hammered effect). Aluminum and baked chrome aluminum paint is used on the inside of oil-burning kitchen ranges.

After cleaning and drying, parts are hung or placed on turntables in the spray room and spray painted. Black baking enamel and chrome aluminum paint are used here for most work. No primers are used, and no masking is necessary for the company's own products. Parts which







Left: Fired ground coat pieces are inspected, then hand-sprayed white.

Upper center: Brushing of edges is done in separate room at the end of the conveyor-dryer.

Lower center: Cover coat parts are fired at 1550° F., for 5¼ minutes. Two cover coats are given top and front panels, one coat to side panels.

Bottom: As completed stoves roll off the assembly line, they are individually tested. They are then ready for crating and shipping.

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are not heated when the stoves, ranges or heaters are in operation are lacquered and air dried. Parts which are heated (which means most parts) are finished with black baking enamel and then put through the electric oven for approximately 35 minutes at 275° F. Each part gets two coats, whether lacquered or enameled. Little shading or blending is necessary, and practically no sanding is necessary either, except where parts are damaged and refinished. Production had to be simplified as there are, for example, 87 sheet metal parts in the combination electric stove, with heater at one end, and most of those parts are painted.

Both "captive" and "job" enameling

All outside range parts (except backs and bottoms), such as the tops, sides and fronts, and the inside of the oven itself, are porcelain enameled white. Porcelain finishing is a big part of this company's business for it not only finishes such parts of its own stoves, ranges and heaters with porcelain, but it also has a division for re-porcelaining such items as other makes of ranges, washing machine tubs, sheet metal sinks, cabinet panels or any other porcelain parts that may have become damaged. This service is used by dealers who find they can save time and money for their stores by having this work done locally.

The porcelain enamel building is twice as large as the sheet metal

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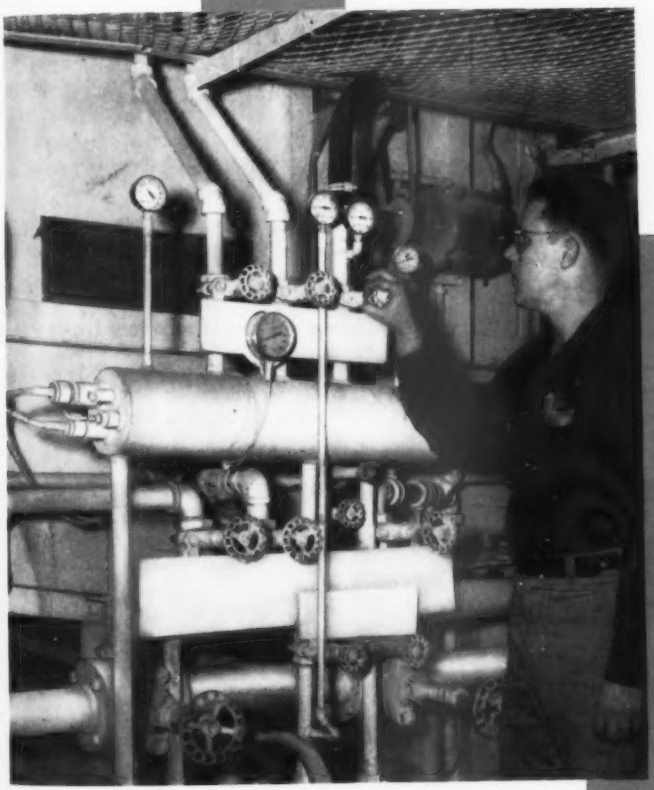
ADS OUT

the SPRA-CON COMPANY



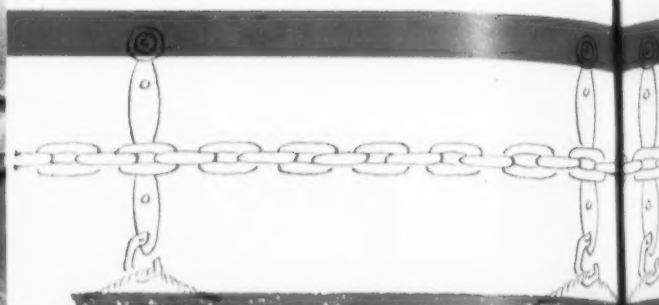
Control section of a Spra-Con automatic paint applicator in The Maytag Company's Plant No. 2, Newton, Iowa.

This is another Spra-Con automatic paint applicator installed in one of the largest washing machine manufacturing plants in the middlewest . . . This automatic paint applicator eliminates prime spray booths — air make-up systems — paint overspray — spray gun operators — maintenance of booths — guns, etc.

The Spra-Con Company

3600 Elston Ave. Chicago 18, Ill.

Spray painter applying the final coat of white on dryer cabinet as it moves along conveyor line.

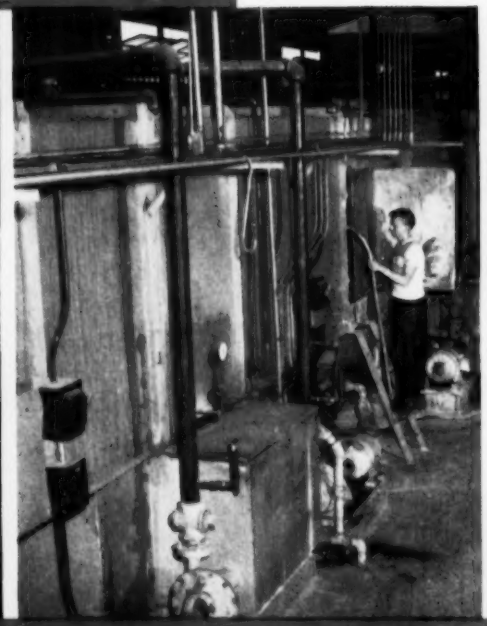


For a step by step study of what happens to a part when it enters the paint finishing system, follow the conveyor along the top of these pages.

the Whirlpool paint story

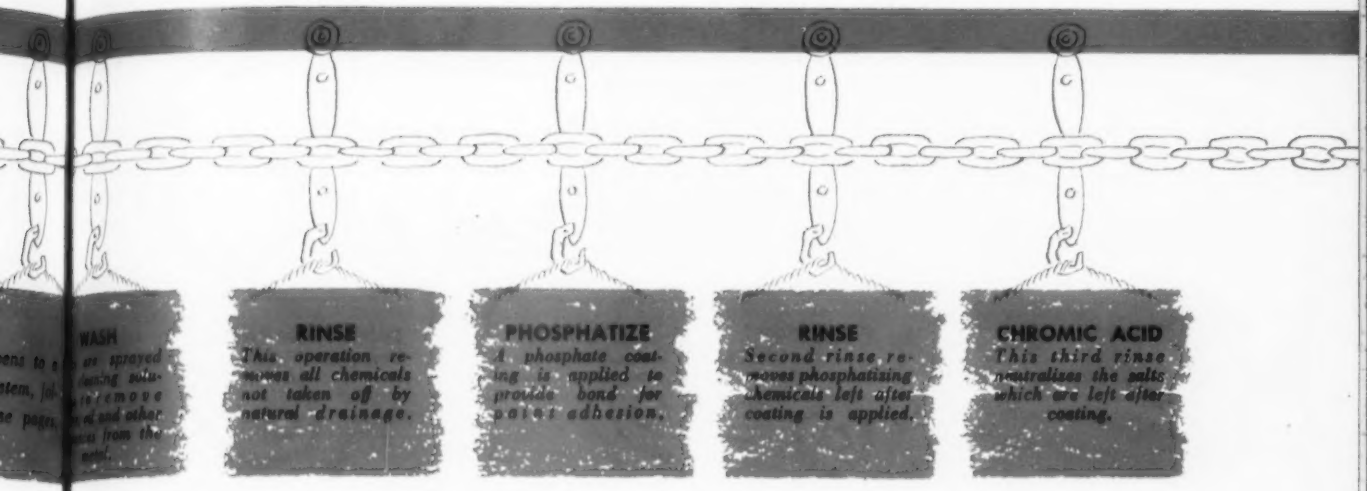
a non-technical photo story of the cleaning and finishing operations for home laundry equipment at Whirlpool Corporation St. Joseph, Mich.

Ready for the paint operation, an automatic cabinet is hung on the conveyor which will carry it through the system.



One of the first operations is the rinse and phosphatizing. Operator is shown looking through one of the oven doors.

Here parts leave the flow coating and protective coverings are removed the areas kept free from paint.


RINSE
This operation removes all chemicals not taken off by natural drainage.
PHOSPHATIZE
A phosphate coating is applied to provide bond for paint adhesion.
RINSE
Second rinse removes phosphatizing chemicals left after coating is applied.
CHROMIC ACID
This third rinse neutralizes the salts which are left after coating.

THE critical eyes of inspectors examine every part that moves from the paint ovens. Their black wax pencils mark gritty spots, uneven finish and other defects so small as to seem inconsequential to an unknowing eye.

But other eyes, perhaps even more critical, may be those of potential customers whose first impression comes not from watching the intricacies of a washer's mechanical operation, but from the evenness and beauty of the washer's bright finish. A bad impression here may mean the loss of a sale and a customer, and that, no company can afford.

The job of pleasing the wary customer's desire for appearance evolves about an intricate painting system which was developed over a long period of time. The task is not just the painting of a single cabinet to a perfect finish, but the painting of hundreds of perfect cabinets every day. That finish must be durable, protective, attractive, and simultaneously turned out in quantity to keep the costs down.

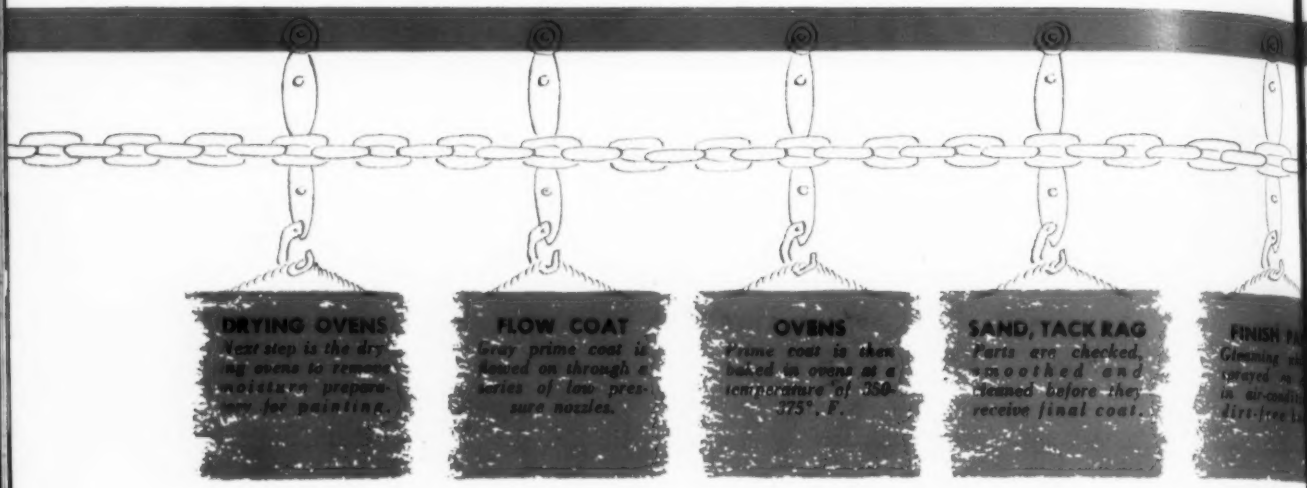
In the various painting departments you see criss-crossing conveyor lines carrying multi-shaded parts hither and yon seemingly without direction. But each part on the line and each foot of conveyor moves according to a detailed plan. The endless conveyor chain is always moving through closed booths, up to the roof ovens, descending, turning, rising and descending again, finally carrying out a glossy white part to its appointed place near the assembly line.

Each week the spray painters shoot about 5,000 gal-

...e given a thorough inspection fol-...the prime coating. Perfect parts continue on the line.

All parts get a general sanding prior to final painting. These workmen are using "jitterbugs" to do the job.

Next workman blows away the dust left after sanding. Now the parts are ready for the spraying line.


DRYING OVENS
Next step is the dry ng ovens to remove moisture, preparatory for painting.
FLOW COAT
Grey prime coat is flowed on through a series of low pressure nozzles.
OVENS
Prime coat is then baked in ovens at a temperature of 350-375° F.
SAND, TACK RAG
Parts are checked, smoothed and cleaned before they receive final coat.

lons of white enamel through their guns, in addition to the thousands more gallons of prime coat and bonderite chemicals used to get a durable final coat.

Preparation for painting starts with preparation of the metal. Parts are sanded smooth, and then, moving on a conveyor, are throughly cleaned and treated with a phosphate rust-inhibiting compound that also furnishes a finish that will hold the paint better than bare metal. After parts are completely dried in ovens, a grey primer coat is applied by flow-coating, and the parts are baked in gas fired ovens at 325 degree temperature for 20 to 30 minutes. After cooling the parts move through inspection points and into the sanding room for a general sanding before the final coat is applied.

The finish coat of white is sprayed on in air conditioned dust free booths as parts move along on the conveyor. The paint flows under pressure from the paint mixing rooms where it has already been mixed to proper viscosity and uniform characteristics for sprayability.

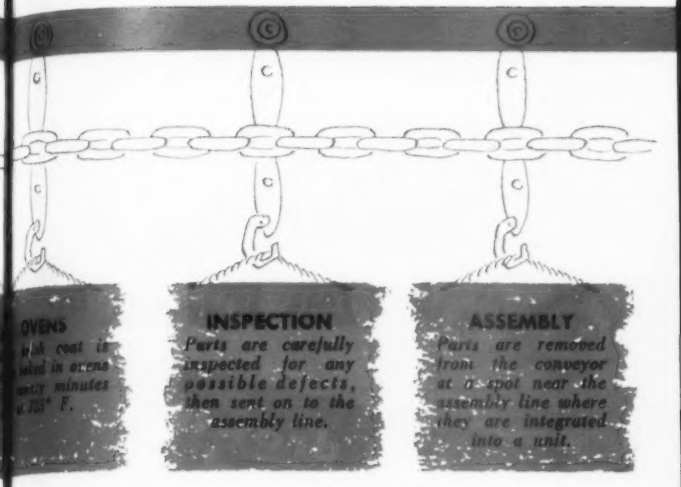
Spray painters in the booths deftly apply a white enamel on the parts, working in front of a wall of water. Excess spray is caught in the falling water and carried to a sump below where later it is reclaimed and sent to the paint manufacturer.

The line then carries the freshly painted parts through the final ovens where the parts travel for 20 minutes in a temperature of 325 degrees. In that final oven the finish is baked on 200 cabinets simultaneously. A cooling period follows before the line descends past the crit-

As the serpent-like conveyor carries parts through the spray booths, sprayers apply the finish coat.

After baking and cooling, parts return to floor level. Another inspector gives Whirlpool top a close inspection for quality.

If it isn't perfect, it doesn't pass. workman re-works a cabinet that meet rigid inspection requirem


INSPECTION
Parts are carefully inspected for any possible defects, then sent on to the assembly line.
ASSEMBLY
Parts are removed from the conveyor at a spot near the assembly line where they are integrated into a unit.

ical eyes of the inspectors. Parts that measure up to perfection stay right on the line to their designated point on the assembly line.

That gleaming white finish will be checked again as the parts are integrated into a unit, and again before being crated. The inspection actually never ends until the customer is satisfied. Even as the unit sits in the warehouse waiting for shipment, Engineering may pick a unit at random and give it a complete series of laboratory pre-shipment tests.

The finish of every washer, dryer or ironer that leaves the Whirlpool has been checked and cross-checked. The long and meticulous treatment given to get that finish has but one aim in mind, — to please the eye of that potential customer.

In the laboratory, paint samples are checked under actual home conditions for both beauty and durability.

Upstairs on the roof, this worker checks the oven and line controls and other regulating devices.

...an lifts a finished cabinet from the ...or line, and sets it aside for imme... use on the final assembly line.

A little-seen operation for the paint system is the mixing. The paint flows under pressure from these vats to the spray machine.

Control man here checks phosphatizing chemicals to make certain of uniform quality that will do a top-notch job.

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Cowles LP is an anhydrous, non-silicated soak cleaner for use on all metals except aluminum. LP removes buffing compounds, drawing compounds, and other soils without pitting or depositing white film on such work as zinc base die castings, brass, steel and other alloys. LP works rapidly and thoroughly. It leaves a chemically clean surface after rinsing.

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NOTE *There is more information on LP Cleaner in this booklet. Send for it!*

Production enameling on small items

a plant geared to produce 250,000 enameled pieces per month with minimum space, personnel and equipment

by Walter Rudolph

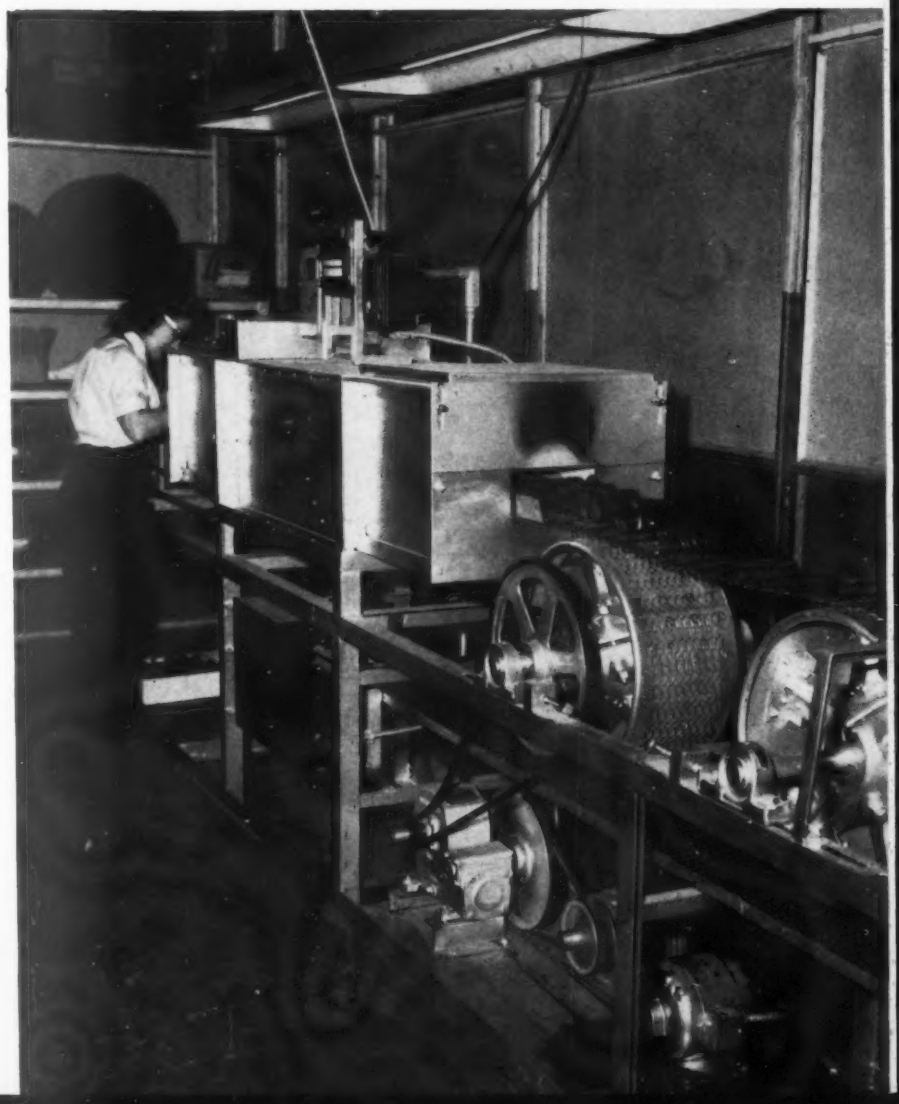
finish In an industry largely concerned with the production and finishing of sizeable products — ranges, refrigerators, washing machines and so forth, — the fellow who steps out and does a job with small pieces of metal approaches the unique. You could walk into Erie Ceramic Arts Co., Erie, Pa., and walk out again with a sample of everything they produce in various pockets, and no one would necessarily know you were carrying more than your purse and a pencil.

Erie Ceramic Arts is young, and bustling. In a little over four years, H. Eric Schaubacker and William Lindner, company officials, have gained an enviable reputation for having the know-how and facilities for mass production of porcelain enameled surfaces with relatively few square inches of area. At this writing, plant expansion was underway to provide room and more equipment, with defense work on radio parts as one of the impelling considerations.

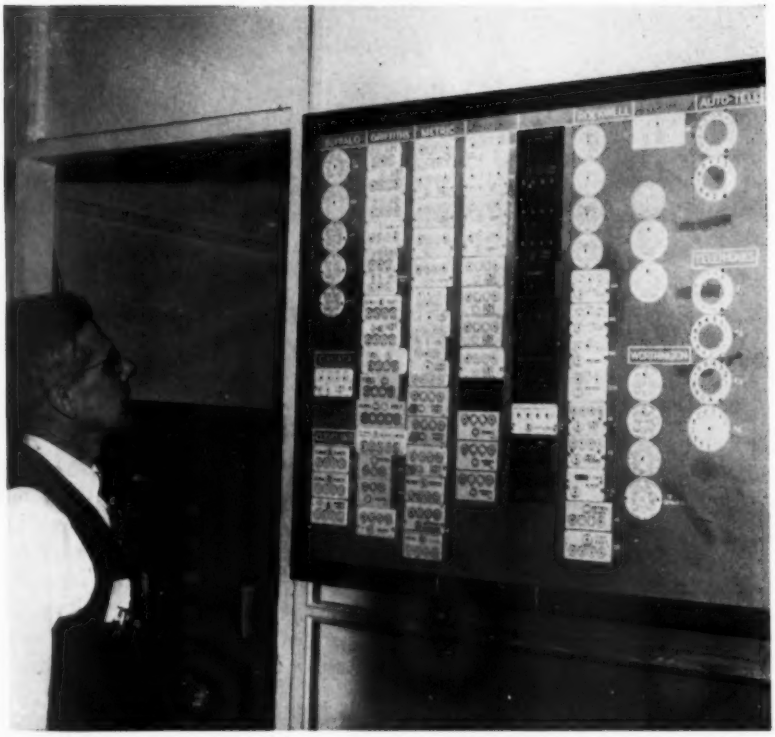
Specifically, Erie Ceramic Arts went after the business of making porcelain enameled dials such as are assembled in gas and water meters, and weather-resistant printing of fireable colors on glass panels — such as assembled in gasoline dispensing equipment. In less than two years, production totaled some 100,000 dials, and unumbered glass pieces per month while employing only a handful of personnel.

More recently, production has branched into the making of telephone dials, and special thermometer backings or panels, resistant to great heat and/or chemical action. Continued growth seems assured, as the durability and fine appearance of small, porcelain enameled items finds new application in many lines.

Copper has been used for the metal base of dials and other items, until recent restrictions called for the substitution of steel in some instances. Erie Ceramic Arts formerly bought dial stampings (as well as the glass panels) but now has its own stamping press, which feeds itself



Steel stampings can be seen emerging from the annealing oven at Erie Ceramic Arts. Several hundred will be loaded, then removed at opposite end by the same operator.



H. Eric Schaubacker, of Erie Ceramic Arts, surveys a display panel of products that feature porcelain enameling on small surfaces. Upwards of 250,000 such items can be produced each month.

Manual labor of silk-screening numbers, etc., on dials, in foreground, is being replaced by mechanized operation on special machines, in background. Note the storage racks.

from rolls of metal, through a roll-feed attachment.

Light gage metal used

Metal thickness sticks pretty close to 30 gage. After stamping (pieces are usually about 2″ x 4″) pieces are boxed and go into a plant-made annealing oven, traveling on a continuous stainless steel belt with special, slitted cross members that hold individual stampings. The pieces are annealed — simply an oxidation process — in a very short cycle.

On this same conveyorized line, pieces (copper) can be dipped into a nitric acid pickling bath and a cold water rinse, with drying accomplished before removal.

Ground coat application

Transferred to special trays or racks, pieces are now ready for ground coating — in the case, at least, of recently begun use of steel. Erie Ceramic built its own ground coating conveyor line, with spray booth and a flat or belt-type conveyor passing the loaded trays immediately into a gas-fired drying tunnel, about 15 feet long.

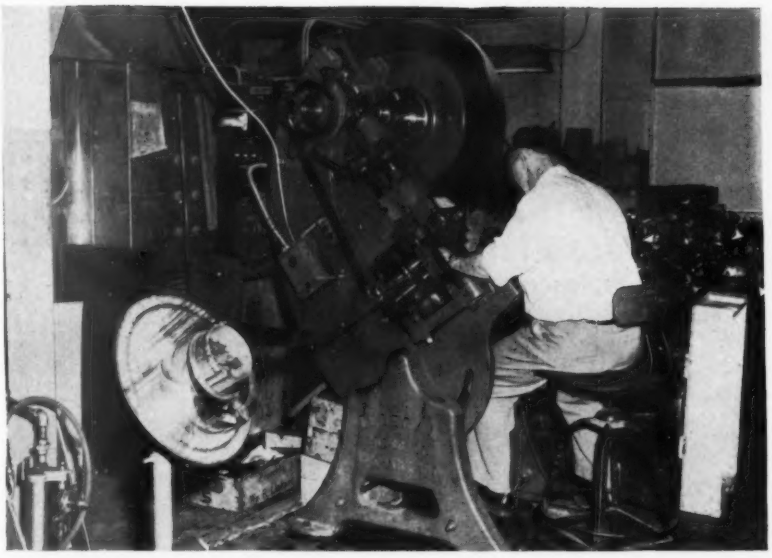
Parallel to the spray-and-drying line, is the line which takes trays through one of the smallest electric furnaces of its kind in use today — about 8 feet long with a foot-square opening. Firing is at about 1600° F. (for steel).

Silk screening on a mechanized basis

After cooling, dial number, etc., are silk-screened onto the pieces. In the past, this has been largely manual labor, with fixtures for positioning and holding each dial, and with individual loading and removal and placement on a tray for firing. Recently Erie Ceramic had installed several machines which promise to put silk-screening on a mechanized basis and will streamline production to a great extent.

Addition of these latter machines will put practically all production of small porcelain enameled pieces on a production basis. After silk-screening, a second firing is necessary.

Right: William Lindner, a company official, demonstrates the firm's new stamping press with roll-feed; stampings were formerly bought from an outside source.



Glass colors used

Gasoline brand names and/or a word or two of advertising go on the glass panels previously noted. A typical panel will measure about 4" x 12" x 1/8". Silk-screening is again employed (Erie Ceramic has hundreds of silk screens in storage for these uses) with fireable colors similar in composition to low temperature enamels. Often more than one color is called for, always applied on the back side of the finished panel.

Firing

After each color application, glass panels are dried in a gas-fired oven. Finally, they are sprayed with a translucent white flux on the panel side that is painted. This finishing operation is made absolutely weather-resistant by firing in an electric oven at approximately 1020° F. for half an hour.

New milling equipment

Erie Ceramic recently added its own enamel milling equipment (250 lbs. capacity), another step toward more efficient operation. It was estimated that the small plant — some 6,000 square feet of manufacturing area — is now geared to about 250,000 porcelain enameled pieces a month, now practically all mechanized.

Center: Steel pieces can be seen on trays entering spray booth of continuous spray-drying line. The tunnel at the left is gas-fired.

Right: Glass panels with brand names, advertising, such as used in gasoline dispensing equipment go into final firing for weather-resistant coating.

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MAGIC CHEF NAMES NEW DIRECTOR OF PURCHASES

Magic Chef, Inc., St. Louis, has announced the appointment of Fred J. Risberg as director of purchases, succeeding Milton G. Kahle who retired after 41 years with the firm.

An active member of the St. Louis Purchasing Association, Risberg assumed his new position after five years as assistant purchasing director in charge of procuring principal raw materials.

RICHMOND RADIATOR JOINS PLUMBING FIXTURE ASSN.

Richmond Radiator Company has joined the Enameled Cast Iron Plumbing Fixtures Association, it was announced at an Association meeting held January 17 and 18, at the Drake Hotel, Chicago. John J. Hall, president, represented the company at the meeting.

Richmond Radiator, an affiliate of Reynolds Metals Corporation, operates plants for the manufacture of enameled cast iron plumbing fixtures at Uniontown and Monaca, Pennsylvania.

PRODUCE COLOR MOVIE ON STEEL CASTING PRODUCTION

"Steel with a Thousand Qualities" is believed to be the only color motion picture devoted entirely to the manufacture of steel castings. The film was sponsored by Lebanon Steel Foundry, Lebanon, Pa., which has just observed its fortieth anniversary. For a cast for the 37-minute film, the company used its own employees almost exclusively.

OPEN NEW AHLMA OFFICE

John J. Reinecke, newly-appointed secretary of the American Home Laundry Manufacturers Association, opened the organization's new headquarters on February 1 at 20 North Wacker Drive, Chicago 6, Illinois.

GARDNER HEADS CHAMBERS NEW BUILDERS DIVISION

Russell Gardner has been appointed head of the newly-created builders' division of Chambers Illinois Corp., distributors for Chambers Corporation. In his new post, Gardner will work with builders, contractors, designers, architects and kitchen cabinet manufacturers to present the company's new line of built-in gas cooking units. He was formerly with Pittsburgh Plate Glass Company.

G-E TRANSFERS ROOM COOLERS TO MAJOR APPLIANCE DIVISION

General Electric Company has transferred their room cooler department from the air conditioning division to the major appliance division, it was announced by Clarence H. Linder, general manager of the appliance division.

Harold B. Donley was named general manager of the new room cooler department which will continue to headquarter at Bloomfield, N. J. Donley has been manager of marketing of the air conditioning division since he joined the company in 1948. He previously was vice president of Hunter Fan & Ventilating Co., Memphis, and was for many years connected with Westinghouse Electric Corp. in the appliance and radio business.

Until the addition of the room cooler department, the major appliance division, with headquarters at Louisville, comprised the refrigerator, range and water heater, home laundry equipment, sink and cabinet departments.

ODIN STOVE PURCHASES HOFFSTETTER INTERESTS

Odin Stove Manufacturing Co., Erie, Pa., has announced the purchase of the interests of R. F. Hoffstetter, former president. Hoffstetter is continuing as chairman of the board.

The following officers were named to the board: E. C. Fisher, president; K. C. Hampel, treasurer and general manager; and T. P. Dunn, secretary. E. K. Hampel was named general sales manager, and A. E. Koch, director of purchases.

Company spokesmen said the transaction in no way effects the operation of the company which was founded by the late C. H. Hoffstetter and R. F. Hoffstetter more than 50 years ago.

1951 GAS RANGE SHIPMENTS TOTAL 2,350,000 UNITS

Industry-wide shipments of domestic gas ranges approximated 2,350,000 units during 1951. This compares with 3,023,200 units shipped during 1950, the industry's all-time peak year. The figures were released by the Gas Appliance Manufacturers Association.

INGERSOLL NAMES ENGR. DIRECTOR FOR LVT SECTION

The appointment of Captain E. E. Roth, U.S.N. (ret.) as director of engineering, LVT Section, in Kalamazoo (Michigan) Works of Ingersoll Products Division of Borg-Warner Corp., was announced by R. A. An-

derson, works manager. Roth will direct the continued engineering and development of a new type amphibian vehicle which Ingersoll developed with the Navy.

As director of the LVT (landing vehicle tracked) engineering program, Roth succeeds Fred W. Cederleaf who was advanced to the position of assistant to works manager, with responsibility for the engineering and development of new defense projects.

CORY CORP. ENTERS AIR CONDITIONING FIELD

Cory Corporation, Chicago, has announced its entrance into the air conditioning equipment field.

J. W. Alsdorf, president of Cory and its Fresh'nd-Aire division, said that production on two sizes of room air conditioners will be in production during the first quarter of this year. The company also announced production of a portable electric room dehumidifier.

HARRY SPENCER TO ENTER ENGR. CONSULTING WORK

Harry L. Spencer, vice president in charge of manufacturing and engineering for the Norge Division of Borg-Warner Corp., announced his resignation February 15. He expects to enter engineering consulting work.

Spencer, who was most recently in charge of all Norge plants, joined the company in 1926 and remained until 1943, when he joined Bendix Home Appliances, Inc., as vice president of manufacturing. In 1948 he returned to Norge in the capacity he held until his resignation.

TV BOWS AS PLANT TOUR GUIDE AT STOCKHOLDERS MEETING

Foote Mineral Company and RCA collaborate in first use of television as means of streamlining and dramatizing "tour" of plant facilities

Television chalked up another "first" on Thursday, February 21, with its use by the Foote Mineral Company, developers and processors of rare mineral ores and chemicals, to implement an annual stockholders' meeting at the company's main plant at Exton, Pa.

By means of television, more than 200 Foote stockholders were able to make a streamlined "tour" of the Exton plant, inspect new facilities, and witness key operations at the company's new Kings Mountain, N.C., holdings without leaving the plant cafeteria in which the meeting was held.

The portable TV gear employed, which was installed and operated by RCA Victor, comprised the most extensive closed-circuit system yet installed for a service of this type, the gear was valued at more than $80,000.

For the first time, "live" television was used to take a group of Foote Mineral Company stockholders on a streamlined tour of the company's Exton plant to show them key steps in the processing of lepidolite ores, and other important features of the company's operations.

Four field cameras were set up in strategic and widely separated locations on the 81-acre Foote property.

Twelve 17-inch RCA receivers were placed in the cafeteria, and a central control and monitor station was installed in a nearby plant building.

The use of television obviated the necessity for long treks from one key operation or new installation to another, and afforded the stockholders a clearer and more concise picture of the overall operation of their company than they could have obtained by actually touring the area.

The plant tour was "conducted" by L. G. Bliss, Foote vice president in charge of sales, who was brought to the TV screens by a camera trained on his temporary headquarters in the monitor station as he supplied the introductions and continuity needed to relate the several sequences of the program.

On the receiver screens in the cafeteria, the stockholders saw first the processing of lepidolite ores from Africa to obtain lithium products used for many industrial purposes, including lubricants, ceramics, and air conditioning systems. Next, by means of a televised film, they were shown the quarrying and processing of spodumens, a source of lithium salts, at the company's Kings Mountain operation near Charlotte, North Carolina. Returned to the Exton plant by the flip of a control switch, they saw more lithium processing where a new process is being evaluated. This was followed by action views of complex operations and equipment used in processing zirconium. The tour closed with a visit to the plant area where various minerals are processed to produce welding electrode coating materials.

Production, pickup, and transmission for this first TV stockholders' tour was handled by six RCA Service Company engineers and two members of RCA Victor's global television production crew.

Commenting on Foote's introduction of this new use of television, Mr.

Bliss predicted that TV will become a valued tool of business and industry for such purposes.

"It provides a unique means of showing stockholders what is being done with their money and how their investments are being protected and enhanced," he said, "without wasting their valuable time and energies and those of company officials in traveling from point to point.

"Further, it makes it possible to present a dramatic vignette of highlights in a company's operations that is more impressive and understandable than a physical tour of the plant. It presents the company's story with more realism and conviction than film can achieve, since it is recognized that there is no window dressing in a TV presentation — no opportunity for cutting and editing."

PRESSED METAL INSTITUTE TECHNICAL MEETING, MAR. 20-21

The program for the 3rd Spring Technical Meeting of the Pressed Metal Institute has been arranged on a panel discussion basis, with each portion of the program followed by a one-hour question-and-answer period. The meeting will be held at Hotel Carter, Cleveland, Ohio, March 20 and 21.

The tentative program, as released by the Institute, is as follows:

"Tooling for Short Runs" — A report on the work done by companies specializing in this branch of the stamping industry.

"Estimating Factors and Cost Analysis for Stamping Quotations" — A panel of interest to all departments of a stamping plant.

"Practical Quality Control for the Stamping Industry" — With government orders requiring quality control, this panel will deal with quality control as it applies to the stamping industry.

"Technical Knowledge for the Stamping Salesman" — This panel will be of interest to production men as well as salesmen.

The registration fee for the PMI Spring Technical Meeting is $20.00, and includes luncheons on both days, a cocktail party, and a bound copy of a report of the meeting. Sessions are open to members, non-members, and technical personnel of other industries.

Reservations should be sent directly to the Pressed Metal Institute, 13210 Shaker Square, Cleveland 20, Ohio.

KELVINATOR TO EXPAND ELECTRIC RANGE BUSINESS WITH PURCHASE OF KALAMAZOO STOVE FACILITIES

Steady expansion of Kelvinator's electric range business will be stepped up as a result of the recent acquisition of range facilities of Kalamazoo Stove & Furnace Co., it was announced by G. W. Mason, president of Nash-Kelvinator Corp.

The $2,000,000 transaction, approved in late January by Kalamazoo stockholders, provides Kelvinator with all Kalamazoo range tools, dies, assembly and checking fixtures, inventories of raw materials, in-process and purchased parts for gas and electric ranges in standard sizes and a new 30-inch size.

Liquidation of current Kalamazoo inventories and transfer of tools and fixtures to Kelvinator's range manufacturing plant at Grand Rapids, Michigan, is expected to help stabilize employment in Grand Rapids, and partly offset cutbacks resulting from government restrictions on materials, it was stated.

Kelvinator has no present plans to manufacture gas ranges "beyond whatever may be necessary for liquidating inventories of in-process parts," Mason said.

REMA ANNOUNCES NEW MEMBERS

The Refrigeration Equipment Manufacturers Association has announced the following new REMA members: Carrier Corporation, Syracuse N. Y.; Penguin Products, Inc., Detroit, Mich.; Freezer Box Division of Annapolis Yacht Yard, Inc., Annapolis, Md.; and Bailey & Perkins Company, Detroit, Mich.

INGERSOLL NAMES RESEARCH HEAD

The appointment of Thur Schmidt as director of research and development has been announced by Robert S. Ingersoll, president, Ingersoll Products Division, Borg-Warner Corp. Formerly assistant to the president, Schmidt will devote his efforts to the development of new manufacturing processes, products and markets.

STEEL KITCHEN CABINET MFRS. QUARTERLY MEETING, MARCH 5

In accordance with plans approved at its first annual meeting held last December 5, the Steel Kitchen Cabinet Manufacturers Association will hold its first quarterly meeting of members at the Cleveland Hotel, Cleveland, Ohio, Wednesday, March 5. Subsequent meetings will be held at the same location on June 4, September 3, and December 3 (annual meeting).

At the first 1952 quarterly meeting, the Washington picture will be reviewed, and further action taken on subjects requiring attention. Attention will also be given to recommendations of Committees, several of which are now at work. As the new Association plans to function in several directions through committees, it is stressed that this phase of the meeting will be of great importance.

RUUD ELECTS NEW OFFICERS, CAMERON NAMED PRESIDENT

Alan B. Cameron, vice president and general manager, has been elected president of Ruud Manufacturing Co., Pittsburgh, Pa. An active member of the American Gas Association, Cameron is a member of the AGA Residential Gas Section's Committee on Housing.

John H. Sorg was reelected vice president and counsel of Ruud, and K. M. Clark was elected executive vice president. Also elected a vice president was Halvard Lintvedt, manager of the company's plant in Kala-

be world

mazoo, Mich. W. M. Latta was elected secretary and treasurer, and W. C. McFarland was named to succeed Latta as auditor.

FORMER RUUD EXECUTIVE DIES

Alfred P. Brill, who retired in 1945 as board chairman of Ruud Manufacturing Co., died recently. An early associate of Edwin Ruud, inventor, Brill joined the firm in 1902. He succeeded Ruud as president in 1932, and became board chairman in 1944.

BOEHLER NAMED PRESIDENT OF EASTERN ENAMELERS CLUB

At the January 26 meeting of the Eastern Enamelers Club, Philadelphia, Joseph Boehler, of Heintz Manufacturing Co., was elected president.

Other officers elected included: vice president, William Donaldson, Chicago Vitreous Enamel Product Co.; treasurer, Dr. George H. Spencer-Strong, Pemco Corporation; and secretary, Dr. Robert F. Patrick, Pemco Corporation.

Following the luncheon-meeting attended by 70 members, Milton I. Allen discussed new industrial development in the greater Philadelphia area. Paul S. Cecil, of The Strong Manufacturing Co., then talked on "The Ti-Loc Process."

CHANGES IN CMP PRODUCT LIST, ASSIGNMENT DIRECTORY FOR ENAMELED PRODUCTS

The National Production Authority issued on February 1, for the third quarter, 1952 use, a revised "Official CMP Class B Product List" and "Product Assignment Directory."

There are a number of revisions from the November 15, 1951, Product Assignment Directory and Class B Product List. Product revisions from Class B to Class A in the directory, reported by the Porcelain Enamel Institute as affecting the enameling industry, are listed as follows:

Breakfast sets, table tops, vitreous enameled; cabinet table tops, kitchen, vitreous enameled; dinette table tops, vitreous enameled; refrigerator parts, vitreous enameled; stove parts, vitreous enameled; table tops, vitreous enameled; vitreous enameled refrigerator parts; vitreous enameled table tops; vitreous enameled stove parts; vitreous enameled washing machine parts; washing machine parts, vitreous enameled.

COOLERATOR NAMES TOP EXECUTIVES, SALES HEADS

Following the recent election of G. L. Rees as president, and S. W. Skowbo as executive vice president, The Coolerator Company also announced two top sales appointments. H. C. Beresford was named director of sales and advertising, and Fred C. Margolf appointed sales manager.

DULANE JOINS NEMA

Dulane, Inc., River Grove, Illinois, has joined the national Electrical Manufacturers Association, and is affiliated with NEMA's Electric Housewares Section and Commercial Cooking Equipment Section.

J. C. NELSON DIES

J. C. Nelson, associated with Easy Washing Machine Corp., Syracuse, N.Y., for more than 30 years, died January 22. He had been president of the American Washing Machine Manufacturers Association, and later was vice president of its successor, the American Washer and Ironer Manufacturers Association.

He joined Easy in 1920 as vice president, and successively was president and general manager and chairman of the board. Retiring from the board on January 1, 1950, he continued his tenure as director, begun in 1924.

HIGGINS RESIGNS FROM APPLIANCE MANUFACTURING

Thomas J. Higgins, for the past three years assistant chief engineer of Appliance Manufacturing Co., Alliance, Ohio, has announced his resignation. His plans for the future were not revealed.

A message about the many uses — *of Fiberglas products in the home was told through this Owens-Corning Fiberglas Corporation exhibit displayed at the National Association of Home Builders Convention in Chicago. The booth — 20 feet long, 8 feet high, and 4 feet deep — showed recently developed Fiberglas cavity wall insulation and other types of home insulation. A large blow-up, showing home appliances and other items using Fiberglas insulation, also was included (right in photo).*

GEORGE VANDER WOUDE TO CHICAGO ORDNANCE POST

George Vander Woude, formerly director of purchases at American Stove Company's former plant at Harvey, Illinois, has been appointed small business specialist of the Chicago Ordnance District, succeeding J. H. Pratt, who was named special assistant to the district chief.

AMERICAN MARIETTA BUYS FERRO PAINT BUSINESS

It is reported that Ferro Corporation, Cleveland, Ohio, has sold its paint equipment, receivables and inventory to American Marietta Corporation, Chicago.

FIBER GLASS CHICAGO OFFICE

Mark J. Wells has been placed in charge of a newly-opened Chicago district sales office of the Fiber Glass Division of Libbey-Owens-Ford Glass Company. He previously was with the Frigidaire Division of General Motors Corp.

CANADIAN COATING CONFERENCE FEATURES PAINT SPECIFICATIONS

A round-table discussion on paint specifications will be featured at the 6th regional conference of the Protective Coatings Division of The Chemical Institute of Canada. The conference will be held at the Royal York Hotel, Toronto, March 14.

The discussion will be headed by Dr. C. Y. Hopkins, of the National Research Council of Canada. The panel of speakers will include: A. P. Austin, Canadian Industries, Ltd.; Dr. W. H. White, Imperial Oil, Ltd.; and Franke Steele, The Glidden Company.

Chairman of the Division is E. T. Thompson, of The Sherwin-Williams Co., and secretary-treasurer is R. J. Allen, of Canadian Titanium Pigments.

PORCELAIN ENAMEL SHOP PRACTICE FORUM, SEPT. 10-12

The 14th annual Shop Practice Forum of the Porcelain Enamel Institute has been scheduled for September 10, 11 and 12 at the University of Illinois, Urbana, Illinois, according to a PEI announcement.

Attended yearly by some 300 representatives of porcelain enameling firms and industry suppliers, the PEI Shop Practice Forum consists of reports and discussions regarding latest porcelain enameling techniques, materials and equipment, and enables an exchange of ideas regarding technical problems and developments with which the industry is concerned. Attendance includes both members and non-members of the Institute.

ROBERTSHAW-FULTON ANNOUNCES PERSONNEL APPTS.

T. T. Arden, executive vice president, Robertshaw-Fulton Controls Co., has announced the appointments of A. W. Beck as sales manager of the Grayson Controls Division, and Hal Singleton as contract administrator for the new Anaheim (Calif.) Division. It was also announced that M. J. Caparone has been promoted to chief engineer.

Beck was a Grayson sales engineer for the past five years. Singleton, formerly Grayson sales manager, will now represent the Anaheim division in all government and military contracts. Caparone was a research physicist for the company.

A. W. BECK

M. P. CAPARONE

H. A. SINGLETON

PHILIP FOWLER DIES

Phillip D. Fowler, a pioneer in the development of the automatic gas water heater, and vice president of Lovekin Water Heater Company, Philadelphia, died recently.

1951 VACUUM CLEANER SALES TOTAL 2,729,104 UNITS

Factory sales of standard-size household vacuum cleaners in 1951 totalled 2,729,104 units. This compares with factory sales of 3,529,412 units in 1950, according to C. C. Frantz, secretary-treasurer of the Vacuum Cleaner Manufacturers Association.

1951 WASHER SALES, 3,301,123; DRYERS TOTAL 486,764; IRONERS, 277,700 UNITS

Factory sales of standard size household washers in 1951 totalled 3,301,123 units, compared to 4,289,931 in 1950, according to industry-wide figures announced by the American Home Laundry Manufacturers Association.

Sales of tumbler dryers aggregated 486,764 units, up 52.8 per cent over 318,488 in 1950. Ironers sold in 1951 totalled 277,700 units, compared to 409,200 in 1950.

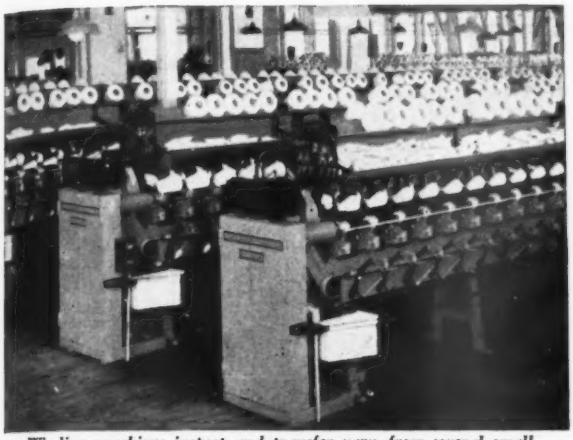
RESISTANCE WELDER MFRS. ASSN. NAMES PRESIDENT

The Resistance Welder Manufacturers Association has announced the election of J. R. Barefoot, Jr. as president. He served as vice president of the Association in 1951. Barefoot is also manager of operations of The Federal Machine & Welder Company, Warren, Ohio.

REMA DEHUMIDIFIER SECTION NAMES STANDARDS COMMITTEE

At a meeting of the Mechanical Dehumidifier Section of the Refrigeration Equipment Manufacturers Association, held in Washington, Jan-

Textile machine shelves get Lasting Enamel Adherence



Winding machines inspect and transfer yarn from several small bobbins onto a single large cone, giving the textile mill a large volume of inspected yarn in one convenient package. Cones are stacked on enameled Electro Paintlok shelves for pick-up. Bobbins are stored in three-quarter-round enameled Electro Paintlok troughs.

BECAUSE yarn must be kept free from lint, snags, oil, dirt, and scale, winding machine shelves and troughs require a smooth, long-lasting enameled finish—one that's easily-cleaned and rust-resistant. For these reasons, this textile machine manufacturer has standardized on Republic Electro Paintlok for both shelves and troughs.

Electro Paintlok is Republic's zinc-coated sheet steel that's chemically-treated to *take* and *hold* paints, lacquers and synthetic enamels. As an official of this company puts it, "We like the way Electro Paintlok always takes a smooth, enameled finish." Even if the enameled surface becomes scratched or broken in use, the tight zinc coating retards the spread of corrosion.

Like more information about Electro Paintlok and its application to *your* painted and enameled steel products? Then, you'll find booklet 525 interesting, informative, factual. Write for your free copy.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

Photo courtesy of Universal Winding Company, Providence, R. I.

REPUBLIC STEEL

Republic
ELECTRO ZINC PLATED SHEETS
Electro Paintlok • Electro Zincbond

Other Republic Products include Carbon, Alloy and Stainless Steels — Sheets, Strip, Plates, Bars, Pipe, Tubing, Bolts and Nuts, Wire

uary 16, H. F. Hildreth, manager, refrigeration specialties division, Westinghouse Electric Corp., and L. C. Love, sales manager, The Ebco Mfg. Co., were elected chairman and vice chairman of the Product Section.

To spearhead an industry standards project, a Standards Drafting Committee was appointed as follows: H. R. Tull, Westinghouse, chairman; B. S. Booher, Frigidaire; R. W. Morgan, Fedders-Quigan; Lars Hansen, Carrier; P. C. Hall, Blissfield Mfg.; S. H. Morse, Primus; and L. C. Love, Ebco.

NORTHWEST CHEMICAL NAMES WESTERN REPRESENTATIVE

H. J. McCracken, president, Northwest Chemical Company, Detroit, has announced the appointment of Alert Supply Company, Los Angeles, as western representative.

Alfred E. Perkins, president of Alert, has included in his background 13 years experience selling for L. H. Butcher Co., of Los Angeles, metal plating specialists. Secretary-treasurer of the concern, Arthur D. Gaskin has had experience with such companies as Bruce Products, Howell, Michigan, makers of buffing compounds; H. A. Montgomery Co., Detroit, manufacturers of special lubricants; and L. H. Butcher Co.

Alert Supply has transferred operations to recently completed headquarters in the central manufacturing district of Los Angeles.

DUFFY HEADS PENNSALT NEW METAL PROCESSING DEPT.

Pennsylvania Salt Mfg. Co. has announced the consolidation of all sales and services in chemical specialties for metal cleaning, fabricating and processing in one sales department named the metal processing department.

Headed by J. J. Duffy, Jr., sales manager, the department represents a merger of the industrial metal cleaners department and the Fos products department. The former produces more than 300 chemicals and chemical specialties for virtually every manufacturing industry. Fos process installations, consisting of compatible cleaning, pickling, phosphatizing and lubrication, are in the steel industry—in cold extrusion of steel, tube drawing, wire drawing and ordnance.

VULCAN-HART ADVANCES COY AND BROWN

Vulcan-Hart Manufacturing Co., manufacturers of commercial gas cooking equipment, has announced the election of Charles C. Coy as vice president and treasurer and E. L. Brown as vice president in charge of the Vulcan Division.

Coy, secretary-treasurer since 1946, was one of those instrumental in the purchase of the Vulcan Division of Standard Gas Equipment Corp., Baltimore, in 1949. The company name was changed to Vulcan-Hart after the purchase.

Brown joined Standard Gas Equip-

"ONCLE THUD SEZ *VEDOC* DEFENSE PAINT IS JEST ABOUT OUR BEST PROTECTION"

Uncle Thud's been getting around lately, for it's true. You just can't beat VEDOC Defense Paint for a good protective finish.

With our World War II experience to draw from, our research staff has been busy finding new and improved ways to give you the very best in government specification finishes . . . finishes that work best with your own coating methods. And we've expanded our production facilities to serve you quicker . . . more efficiently.

Whether your orders are for gallons or drums, each one receives the same prompt and thoughtful attention that has helped Ferro build a reputation as a good, dependable source of supply.

When you bid on Defense Orders calling for specification finishes, let us help you. Write to Ferro for quotations and assistance on any Defense Paint problems.

Remember, Ferro is set up to provide Complete Organic Coatings Service. From the development of diversified protective coatings—to the designing and installing of efficient finishing oven systems.

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ment in 1933 as storekeeper. After working in material control, purchasing and production control, he was made production manager of Standard Gas Equipment in 1944. He joined Vulcan-Hart in 1949 as manager of the Baltimore plant.

GLIDDEN NAMES TOM ARMEL NAT'L INDUSTRIAL SALES MGR.

Appointment of Thomas N. Armel as national industrial sales manager

was announced by A. E. Duncan, vice president, Paint & Varnish Division, The Glidden Company, Cleveland.

Armel will be responsible for Glidden's industrial coating and industrial maintenance sales throughout the country, and will report directly to Duncan. Previously, he was a member of the sales department of the Nubian Industrial Division, Chicago. He joined Glidden in 1940.

In 1950, Armel was winner of the $1000 Greater Glidden Award for outstanding sales achievement. His performance of that year was adjudged best in all aspects of selling throughout the country and in all divisions of the company.

COWLES APPOINTS CLABAUGH

Cowles Chemical Company, Cleveland, has announced the appointment of Carl C. Clabaugh as technical man in the Philadelphia-Eastern Pennsylvania territory. It was pointed out that this new appointment expands Cowles coverage of the metal cleaning market.

REFRIGERATION EQUIPMENT MFRS. TO MEET MARCH 26-28

The annual meeting of the Refrigeration Equipment Manufacturers Association and its related sessions will be held at The Greenbrier, White Sulphur Springs, W. Va., March 26, 27 and 28. The first day will be devoted to a meeting of the board of directors, with the product section meeting on the second day, and the annual membership meeting on the third day.

NELSON HEADS PNEUMATIC SALES FOR SUNDSTRAND

Robert N. Nelson, assistant sales manager, has been promoted to sales manager of the pneumatic division of Sundstrand Machine Tool Co., Rockford. He joined the company in 1946 as a sales engineer.

Ransburg NO. 2 PROCESS

The World's Finest Spray Finishing Equipment

Ransburg finishing systems—in operation from coast to coast, and in foreign countries, as well —are acclaimed as

THE MOST EFFICIENT SPRAY COATING PROCESSES EVER DEVELOPED

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Electrostatic Painting Processes

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RANSBURG

GAS WATER HEATER SHIPMENT FIGURES FOR '51

Shipments of approximately 118,300 automatic gas water heaters in December brought the total for 1951 to 1,931,200, as against 202,500 units in December, 1950, and 2,363,100 for the 1950 year, according to Edward R. Martin, director of marketing and statistics for the Gas Appliance Manufacturers Association.

NATIONAL ELECTRIC SIGN ASSN. MEETS IN CHICAGO

The 6th annual convention of the National Electric Sign Association was held at the Sherman Hotel, Chicago, January 20-23. Registration for the meeting topped the 1200 mark.

Officers elected for the current year include: Harry F. Belsinger, Belsinger Sign Works, Baltimore, president; J. C. Zimmerman, J. F. Zimmerman Sons, Dallas, vice president; Frank C. O'Neill, Acme-Wiley Corp., Chicago, treasurer; and M. R. Ely, Chicago, executive secretary.

New directors elected by mail ballot prior to membership meeting include: Charles B. Burkhart, president, Stalcup Neon, Kansas City, Mo.; Sidney Lipkins, Broadway Maintenance Corp., New York City; and Charles Bunch, Acme Electric Corp., Cuba, New York.

A feature of the convention was the awarding of prizes in NESA's annual sign design competition. The subject for the competition was a motel.

First prize went to Delbert T. Boyer, designer, Goodyear Tire & Rubber Co., Akron, Ohio; Second prize, G. L. Guyett, Stalcup, Inc., Kansas City, Mo.; Third prize, Thom Runkle, General Neon Co., Santa Ana, Calif.; Fourth prize, Eugene W. Hargens, Electrical Products Corp., San Francisco.

Honorable mentions went to the following: James Calcott, Federal Enterprises, Inc., Chicago, Jason R. Brooks, General Neon Co., Santa Ana, Calif.; Glen L. Guyett, Stalcup, Inc., Kansas City, Mo.; Monroe Leung, Electrical Products Corp., Los Angeles; Robert H. Vandre, Federal Enterprises of Texas, Inc., Dallas, and Delbert T. Boyer, The Goodyear Tire & Rubber Co.

Above: Elbert Smith, Stalcup, Inc., accepting the Corning Award for his company, which received the award because their designer, Glen Guyett, received the highest prize won by a sign company employee in the annual electric sign design competition.

Below: View of a portion of the exhibit hall at the National Electric Sign Association annual convention in Chicago.

PAINT FEDERATION REVISES COLOR APTITUDE TEST

The Federation of Paint and Varnish Production Clubs made the first public presentation of a revised edition of the Inter-Society Color Council Color Aptitude Test at the Council's 21st annual meeting held in New York City, February 7, 8 and 9.

The test is designed to be administered to prospective candidates for color matching jobs in which the ability to make fine color discriminations is essential. It was stated that the test will be useful in any industry where color discrimination is an important factor in product control.

The test was produced in cooperation with the Color Aptitude Test Committee of the Inter-Society Color Council with funds provided by the Federation through its Research Committee under the chairmanship of Paul O. Blackmore. The Federation announced that it plans to produce and distribute the test in quantity as soon as sufficient test data is available to make the validation complete, probably by the middle of this year.

MIDWEST ENAMELERS DISCUSS ONE COAT APPLICATION

At the February 9 meeting of the Midwest Enamelers Club, Chicago, W. W. Hintalla, of U.S. Steel, used slides to illustrate his talk on enamel sheet production.

Ben Sweo, of Ferro Corp., followed with a discussion of "Direct Application of Cover Coat to Steel." Necessary requirements for successfully applying cover coat direct to steel, said Sweo, include: (1) a surface roughened "beyond what we normally do", and (2) the deposition of nickel by chemical reduction method. He stated that production of wall tile in one coat has been underway for 18 months at a Baltimore plant, using a zirconium type enamel fired at 1380-1400° F.

Sweo stressed that in all cases of good adherence, a good degree of roughness must be present at the enamel-metal interface. Such roughness occurs in the presence of cobalt, nickel or molybdenum, he added.

An overseas guest at the meeting was Dr. A. Rees-Jones, of Parkinson Stove Ltd., Birmingham, England.

Upper right: Ed Miller (Ferro), Bert Holloway (Roper), Dr. A. Rees-Jones (Parkinson Stove).

Upper left: Richard Dudney (Ferro), Henry Cassabaum (Lindemann & Hoverson), Arol Hall (Globe American).

Right: Ralph Foraker (Pemco), Ted Hartshorn (L & H).

Left: Ben Sweo (Ferro), Mel Gibbs (Inland Steel).

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Right: A. E. Twiehaus and W. W. Hintalla (U. S. Steel).

Left: W. J. Vodicka (Aetna Porcelain), Ed Czolgos (Century Vitreous), John Cordes (Metalloy).

Right: A. Rasmussen and Robert Kroc (Fahralloy).

Left: John Keiser (Seeger), G. Holzberger (O. Hommel).

Lower right: Ed Seabright (Philco), Marcel Pouilly (DeVilbiss), Geo. Guerrini (Philco).

Lower left: Roy Beck (Binks), Harold Gray (Vitreous Steel), A. S. Ault (Chicago Vitreous).

PLANT ADDITION FOR MCDANEL

New construction which will house an enlarged machine shop is under way at McDanel Refractory Porcelain Co., Beaver Falls, Pa. The two-story building which will adjoin the McDanel plant will give four thousand square feet of floor space for manufacturing.

The removal and expansion of machining operations from the main plant to the new wing will free space for the enlargement of the company's research laboratory and facilities. The new building is scheduled for completion in April.

TINNERMAN NAMES TAYLOR GENERAL SALES MANAGER

William H. Taylor, formerly director of engineering and assistant to the vice president, Tinnerman Products, Inc., manufacturers of Speed Nut fasteners, has been appointed general sales manager.

A. H. Tinnerman, president, said Taylor has a background of some 25 years of sales, engineering, and sales management experience. Taylor joined the company as a salesman in 1945, and later became sales manager of the Detroit office, and assistant to George A. Tinnerman, vice president.

HOFFMAN NAMED SALES MGR. OF HARRINGTON & KING

Wesley H. Hoffman, formerly Chicago district sales manager of The

Harrington & King Perforating Co., has been promoted to general sales manager, it was announced by Foye P. Hutchinson, president.

With H & K for more than twenty years, Hoffman is well known in industrial circles where metals and other sheet, plate and coil materials in perforated form are used for industrial processing and ornamental applications.

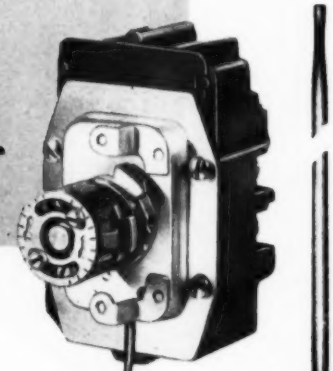
NANCE TO NORTHWESTERN BOARD OF TRUSTEES

The election of James J Nance, president of Hotpoint, Inc., to the board of trustees of Northwestern University has been announced by Kenneth F. Burgess, president of the board.

CROSLEY FREEZER POLICY COVERS FOOD SPOILAGE

A comprehensive insurance policy covering food spoilage due to outside power interruption or any mechanical failure of the appliance has

ALL 4 IN ONE UNIT



Robertshaw®

1. DOUBLE POLE THERMOSTAT
2. AUTOMATIC HEAT SELECTOR
3. TWO-CIRCUIT SWITCH
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a Simple turn of the dial

automatically cuts in two elements for quick pre-heating. Shortly before pre-heat temperature is reached, control cuts out No. 1 element to minimize overshoot; then automatically cuts out No. 2 element, then automatically maintains temperature by recycling No. 2 element.

Compact. Fully automatic. Easy to install. Write for full information.

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THERMOSTAT DIVISION

ROBERTSHAW-FULTON CONTROLS COMPANY

YOUNGWOOD, PENNSYLVANIA

been made available to purchasers of Crosley home freezers by the Crosley Division of Avco Mfg. Corp., it was announced by S. L. Faust, manager of the freezer sales section.

FRANK MCGRATH FORMS NEW COMPANY

Frank McGrath, until recently vice president in charge of sales for Appli-

ance Manufacturing Co., Alliance, Ohio, has formed the Frank McGrath Company, manufacturers agents, with headquarters in Alliance.

McGrath was with Appliance Manufacturing for 11 years. Prior to this connection he was for 10 years with The Barton Corporation as vice president in charge of sales. He has been active in the American Home Laundry Manufacturers Association, and currently is chairman of the Conventional Washer Committee, and a member of the AHLMA executive board.

UNITED LACQUER NAMES TECHNICAL DIRECTOR

William E. Knappman, a veteran of 24 years in the field of paint research, has been appointed technical director of United Lacquer Mfg. Corp. He will direct research activities in the firm's development laboratory, which currently is being tripled in size.

Knappman was formerly chief chemist of Reichold Chemical Company's eastern resin division sales service laboratories for four years. Before that he was with General Chemical Company for ten years, where he did fundamental research on raw materials of the paint industry, including pigments, plasticizers and nitrocellulose.

BELLAIRE NAMES CARBERRY

The Bellaire Enamel Company has announced the appointment of Donald G. Carberry as housewares representative in Eastern Pennsylvania, Delaware, Southern New Jersey, Maryland, and the District of Columbia.

HOOKER HEADS COMPRESSED GAS ASSN. & CHLORINE INST.

R. W. Hooker, vice president in charge of sales, Hooker Electrochemical Co., has been elected president of the Compressed Gas Association. He was also reelected president of The Chlorine Institute for the fourth successive year.

Our plants are part of your production line
Our Production Planning
Quality
Testing
Application
Research
...Are all geared to meet your requirements
Ask your Fiberglas representative about these services
The universal appliance insulation
FIBERGLAS INSULATION MADE BY
OWENS-CORNING
FIBERGLAS
insulated
OWENS-CORNING FIBERGLAS CORPORATION • TOLEDO 1, OHIO.
*Fiberglas is the trade-mark (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation for products made of or with fibers of glass.

DETREX SUPERVISOR DIES

Edwin F. Lankes, eastern region supervisor for Detrex Corporation, died January 22.

FOOTE EXEC. IN EUROPE

Gordon H. Chambers, executive vice president of Foote Mineral Company is making a short business trip through Europe and North Africa. This is one of many similar trips which Chambers has made during the past 15 years to promote the sale of the company's standard products and to purchase raw materials.

MORRISON ENGR. NAMES FLEMING GENERAL MANAGER

Leonard Davis, president, Morrison Engineering Corp., Cleveland, O., has announced the appointement of T. F. Fleming as general manager, and also as head of the metallurgical department. Fleming formerly was supervisor of the heat treating department of National Screw & Manufacturing Co.

Morrison produces a line of continuous heat treat furnaces, annealing furnaces, flash bakers, aluminum hardening ovens, core ovens, paint ovens and forging furnaces.

BORG-WARNER ESTABLISHES PRODUCTS DEVELOPMENT LAB.

Borg-Warner Corporation has announced the establishment of a products development laboratory, in Detroit, as a separate division with responsibility for carrying both defense and civilian items from the invention stage to actual production.

Occupying 20,000 square feet of floor space, the laboratory will be under the direction of David T. Sicklesteel, general manager. He was formerly vice president in charge of engineering of Borg-Warner's Detroit Gear Division.

MAYTAG NAMES NUNN ASS'T ADVERTISING MGR.

Ralph Nunn, member of the advertising staff of The Maytag Company since August, 1948, has been named assistant advertising manager. Nunn had been serving as acting advertising manager in the absence of Dean Landis who was recalled to active military duty with the Air Force some 17 months ago. Landis recently returned to his post as advertising manager.

DUPONT NAMES WHITE PIGMENTS SALES MANAGER

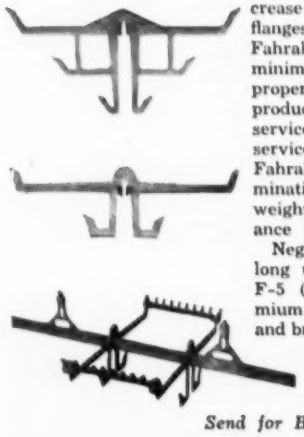
The appointment of Roy E. Troutman as sales manager for white pigments has been announced by Dupont Company's pigments department. He succeeds William R. Morpeth, who is continuing in an advisory capacity pending his retirement later this year.

HANSON-VAN WINKLE-MUNNING NAMES METAL CLEANERS HEAD

Hanson-Van Winkle-Munning Company, Matawan, N. J., has announced the appointment of Charles N. Chalfant as manager of industrial cleaner sales. Chalfant was recently with Optimus Detergents Company, and earlier with Wyandotte Chemicals Corp.

FAHRALLOY Burning Tools for *your* WORK

STANDARD OR TO ORDER



Today's variable steels increase hazard of distorting flanges or marking ware. Fahralloy experience assures minimum bearing area and proper suspension of your product. Less rejects, longest service life, lowest per-hour service cost are yours through Fahralloy research, with elimination of non-essential weight, and positive endurance under thermal stress.

Negligible weight loss in long use of Fahralloy Grade F-5 (65% nickel, 20% chromium). Minimum warpage and breakage. Fahralloy Grade F-1 (35% nickel, 15% chromium) used in many applications.

Send for Burning Tool Catalog 48

THE FAHRALLOY COMPANY

150th and Lexington Avenue — HARVEY, ILLINOIS

YOUNGSTOWN ADDS ROTARY CORNER CABINET

A rotary corner wall cabinet has been added to the Youngstown Kitchens line. Three circular shelves, each 22 inches in diameter, holds cans, bottles, packages or dishes which can be brought to the front with a flick of a finger. The shelves are welded to a center post which turns on a ball bearing. Door of cabinet is gently curved, following contours of shelves.

Making stoves and ranges in Pacific Northwest

(Continued from Page 28)

assembly building, with plenty of space for storage. Parts to be finished are first cleaned in a separate room at one end of the building. Monel baskets, suspended by cranes, lower the parts into the tanks — cleaning, rinse (warm water), hot sulphuric acid, cold rinse and neutralizer. As in sheet metal fabrication and baked enamel, long runs are the order of the day for economical production.

Standard procedure is followed in grinding the enamel in the three mills, running the milled enamel through a centrifugal sieve and magnetic separator, etc. The layout is simple. Cleaned parts come from the separate room directly to the dip tanks where all parts are ground coat dipped, then hung above the tank and drip pans, which flank it, to drain.

The dipped parts are placed on the conveyor which runs through the dryer, and after five minutes of drying are taken off and put on racks. Black, reinforcing enamel is sprayed on the edges in one spray booth (located at the end of the conveyor-dryer), and then the parts are fired at 1550° to 1560° F. Furnace time for ground coats varies with the gage of the material, but 20 gage enameling steel of regular shape gets a furnace time of five minutes — rolled edges and thicker gage material slightly longer.

After air-cooling on the racks, the ground coat pieces are wheeled to a second spray booth, adjacent to the conveyor-dryer. Here they are inspected, and rubbed off with a stone if any bumps or lumps are spotted. Most parts are hand sprayed white, with other colors being used only on "outside" jobs.

After the cover coat is sprayed on, the parts are put through the dryer. If brushing for designs or edging is necessary it is done in a separate room at the end of the conveyor-dryer.

The parts are then fired at 1550° F. for 5¼ minutes. Two cover coats are given to top and front panels, one coat to side panels. If the name "Pacific" is to be put on a panel, it is now put on by silk screen process, and refired for about two minutes.

Enameled parts wrapped for storage

Parts to be used immediately in assembly are placed and left on their racks until wanted, but panels which will not be used in the immediate future are paper-wrapped and boxed, and left in storage.

All through production and finishing wheeled dollies are used for material handling. In final assembly the baked enamel or porcelain enamel parts are placed on both sides of a raised track. Assembly is done on dollies which run on the track; each man has charge of specific component installations. As the assembled electric stoves roll off the line they are given a series, and 220 test. They are then ready for crating and shiping.

Use NAGEL-CHASE V-BELT PULLEYS *for PRODUCTION ECONOMIES*

on AUTOMATIC WASHERS and DRYERS!

More and more manufacturers are standardizing on NAGEL-CHASE V-Belt Pulleys for their automatic washers and dryers.

Made from pressed steel and welded they have the strength and wearing qualities that provide long, trouble-free service. Belt wear is reduced to a minimum. With the Nagel-Chase construction the pulley cannot become loose from the hub.

Along with these advantages, Nagel-Chase pulleys frequently offer substantial savings in production costs.

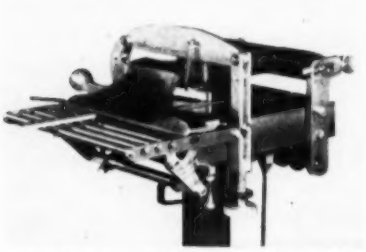
Consult Nagel-Chase on your pulley requirements today!

THE NAGEL • CHASE MANUFACTURING COMPANY
2811 N. Ashland Avenue, Chicago 13, Ill.
SPECIALISTS IN CASTERS AND PULLEYS FOR NEARLY A QUARTER CENTURY!

ALSO MANUFACTURERS OF NAGEL-CHASE WASHING MACHINE CASTERS

New Supplies and Equipment

C-31. Metal forming machine for short production work



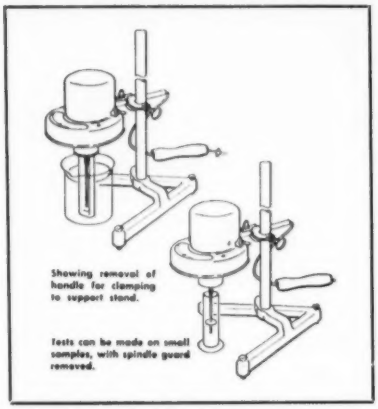
An improved Bendit metal forming machine is said to eliminate the need for expensive tools, intricate tooling and specialized skills. Metal sheets, rods, strips and tubing can be bent and shaped into many complex as well as simple forms. Its operation is said to be as fast as the operator can manipulate the machine, up to 20 bends per minute in light stock.

Capacity for mild steel, hot rolled, or equivalent: 18 gauge, 15" wide; 16 gauge, 8" wide; 1/8" strip, 1 1/2" wide; 3/16" strip, 5/8" wide; 1/8" iron pipe; 3/8" round bar stock. The machine is said to be particularly adaptable for short-run production work.

More Information

For more information on new supplies, equipment and literature reviewed here, fill out the order form on page 59, or write to us on your company stationery.

C-33. Synchro-electric viscometers



Synchro-electric viscometers of the type shown can be used for rapid, dependable, direct measurements of the viscosity of flow characteristics of materials varying from the near-solid to the most fluid and to temperatures varying from sub-zero to that of molten glass.

C-32. Vinyl-type paint spray booth coating material

A new vinyl-type paint spray booth coating material has been developed for use on the side walls of both water-wash and dry paint spray booths. The material is said to possess rapid drying properties, and when sprayed on a booth wall forms a tough plastic film with exceptionally high tensile strength. It is to be impervious to paint, enamel, lacquer and water.

The low adhesive properties of the material is said to make booth maintenance a simple and rapid operation. When paint over-spray has been built up, the coating and all over-sprayed paint is peeled off inlarge sheets. A gallon of the material is said to be able to cover from 275 to 400 square feet, depending upon desired thickness.

C-34. New conditioning agent for paint spray booths

A new conditioning agent for paint spray booths is used in the water circulating system, and is designed to prevent adhesion of paint to the curtain wall, and to assist the water cascade in preventing escape of paint into atmosphere.

Production tests are reported to show that even under prolonged operation, the agent prevents clogging of nozzles, louvres, baffles and return lines. Investigations reveal that the agent precipitates some types of paints on the surface of the water reservoir, permitting easy removal.

C-35. New timer for clothes dryers

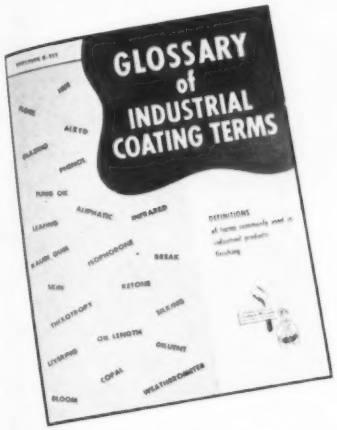
A new addition to a line of timers and time switches is said to be particularly adapted to use in the control cricuit of clothes dryers since it provides two circuits for the control of blower and heater, in one compact unit. The two circuits are so arranged that the heater circuit may be broken at a predetermined time prior to the breaking of the blower circuit; this provides a cooling period before the actual shut-off of the clothes dryer.

Industrial literature

301. Facilities survey book for prime contractors

If you are a prime contractor in need of additional facilities for metal fabrication and/or metal finishing, send for this facilities survey book outlining the possibilities of an important mid-western plant for serving you. Included is an outline of excellent facilities for aircraft assembly work. Write on your letterhead to *finish*.

302. Free booklet lists 200 industrial coating terms



More than 200 definitions of terms commonly used in industrial products finishing are contained in a new 16-page booklet, "Glossary of Industrial Coating Terms," released by a leading industrial finishes producer.

Here is valuable information for every industrial finishing man, and an important addition to plant and industrial finishing libraries. Sent free if your request is sent on your company letterhead.

303. Twenty-page press brake catalog

A new catalog gives design details and specifications of a complete line of press brakes with capacities from 15 tons up. The profusely illustrated booklet shows press brakes in use in plants of manufacturers of appliances, airplanes, television, agricultural implements, etc.

304. Tubular shape frit grinders

A new bulletin contains information on tubular shaped frit grinding cylinders. It is said that the frit grinders, using the cylinders, are consistently reporting grinds of as much as 53% faster, with batches up to 430% finer not at all unusual.

305. New instrument for better control in porcelain enamel plants

A new instrument for control in porcelain enamel plants, known as a "Fluoreter," works on the principle of fluorescence caused by ultraviolet light.

By using the Fluoreter (about the size of a flashlight), spot checks can be made for mineral oil contamination during all phases of production —on bisque forms, in the pickle room, in drawing compounds, etc.

Another use of the Fluoreter is to determine the pH of various solutions. Still another use is to identify mill addition materials and other chemicals.

The accompanying illustration, from a recent publication, shows the Fluoreter being used in an enamel plant. In this case, it was necessary to check corners on ware being processed. For this purpose, the instrument has a special accessory consisting of a soft, sponge-rubber ring cone. The rubber can be made to conform to the shape of the object, and the Fluoreter chamber can be placed in this cone, which cuts out all extra light, to make the determination under ideal conditions.

Included in the booklet is a table on fluorescent ceramic materials.

FINISH
360 N. Michigan Ave.
Chicago 1, Illinois

Please forward to me at once information on the new supplies and equipment and new industrial literature as enumerated below:

No.____ **No.**____ **No.**____ **No.**____

No.____ **No.**____ **No.**____ **No.**____

Name _____ **Title** _____

Company _____

Company Address _____

City _____ **Zone**____ **State** _____

finish SUGGESTION BOX

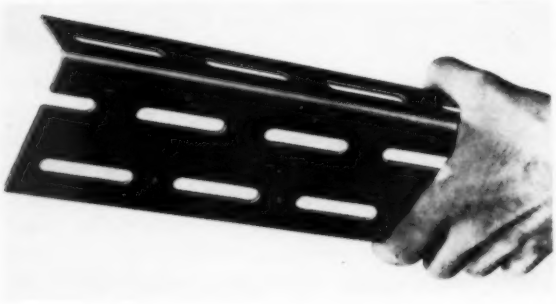
New erector set—an all purpose fabricating unit

THE lengthwise rows of slots in this "industrial erector set" unit permit the rapid assembly by bolting of shelving, bins, scaffolding, ladders, assembly tables, motor and machinery mounts, coat and hat racks, partitions, chairs, cabinets, desks, conveyor-line structures, benches, skids, trays, machine guards, hand rails, and a host of other plant equipment as broad as the imagination of the user. Units are 10-feet long, 3x1.5x.-080-in. slotted-leg galvanized-steel angles.

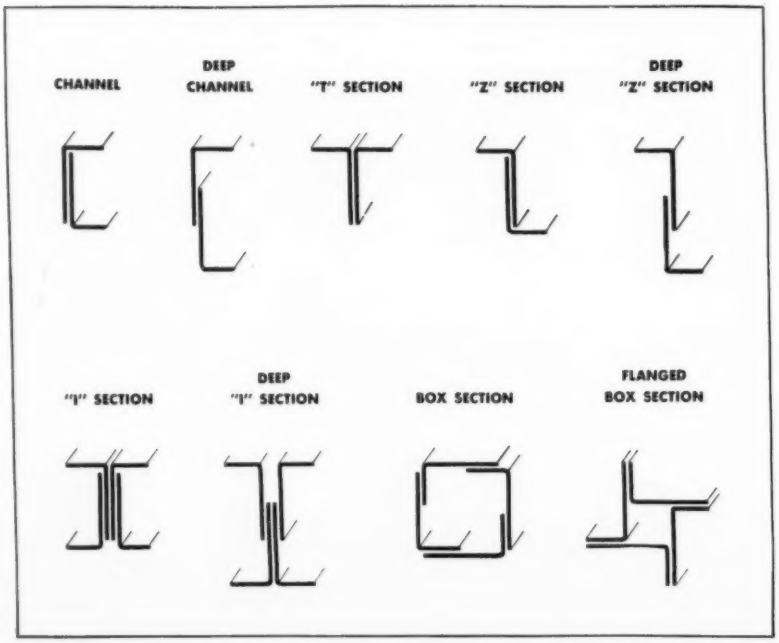
Although never before available in the United States, the development is reported to have found wide application in the manufacturing plants of England, Canada and Australia.

A hacksaw and a wrench are the only tools needed for assembly. However, the cutting operation can be speeded by the use of a special one-stroke shear-type cutter. Equipment can be built, altered or dismantled in a matter of minutes and, regardless of size, the material is 100% re-useable. No special brackets, braces, clips or hooks are required. Drilling and welding are unnecessary.

Diamond-shaped indentations spaced at 3-in. intervals along the full length of the angle make measuring and cutting a simple operation. Slots are automatically in alignment for bolting when pieces are cut along these indentations.



Three rows of staggered slots in the fabricating units—two in the 3-in. leg, and one in the 1.5-in. leg—permit rapid assembly by bolting. Diamond-shaped indentations simplify measuring and cutting.



Mobile units too

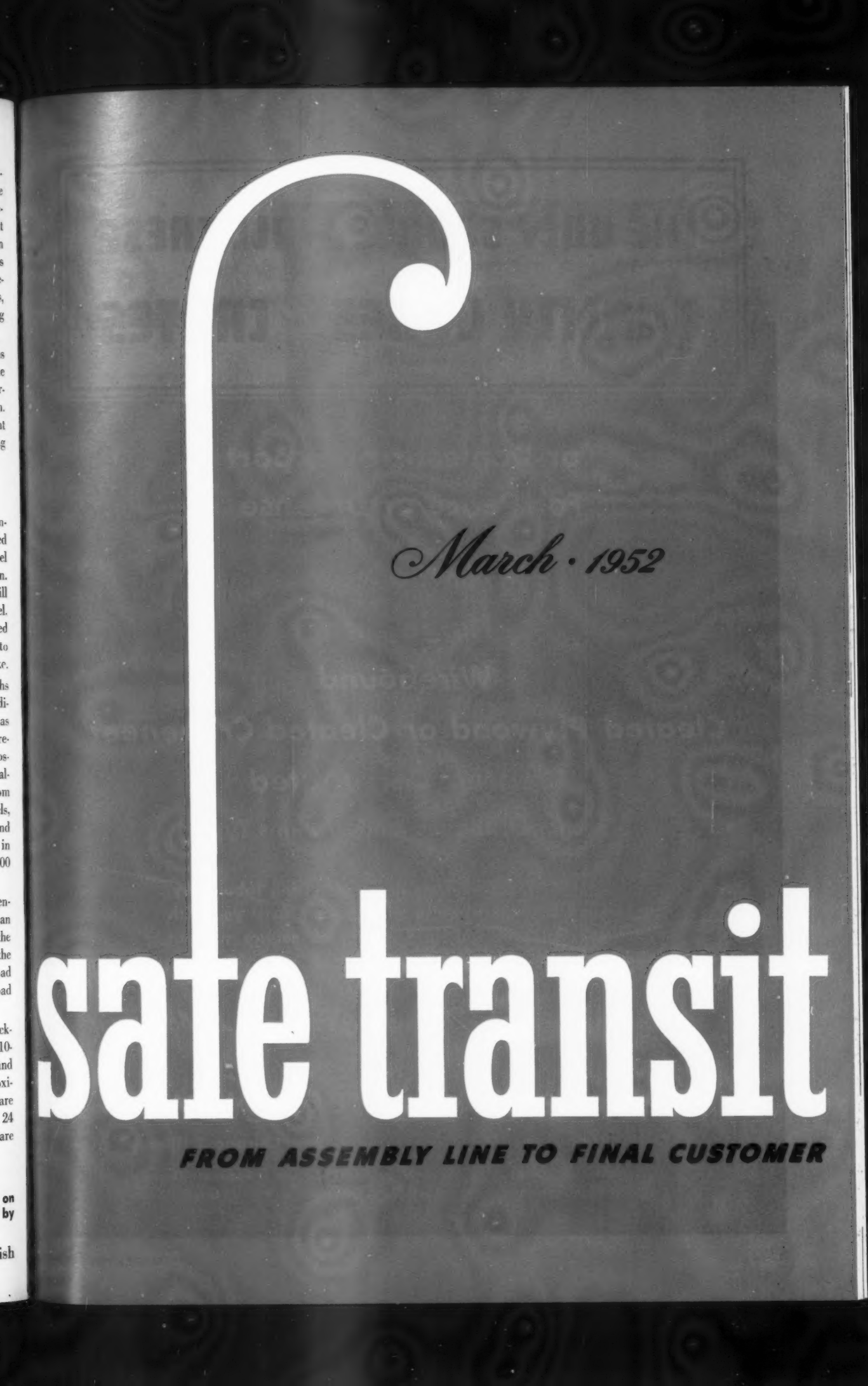
Auxiliary components such as panels and casters give the assembled equipment a wider versatility. Steel panels, 36x6 in. and having 1-in. flanges, provide shelving that will support loads up to 300 lb per panel. Ball-bearing casters quickly applied to the units provide portability to bins, carts, hand trucks and the like.

When used as uprights in lengths up to 5½ ft, these angles will individually support loads as high as 1200 lb. Longer lengths than this require bracing or assembly as composite sections for satisfactory load values. Sections that can be made from the standard units are: C-channels, T-sections, Z-sections, I-sections and box sections. When assembled in this manner, loads as high as 4000 lb are possible.

When used horizontally, concentrated loads from 90 to 3800 lb can be supported, depending upon the distance between supports and the section constructed. When the load is evenly distributed, these safe-load figures can be doubled.

The material is sold by the package. Each package contains ten 10-ft lengths of angle and 75 bolts and nuts. Shipping weight is approximately 110 lb. Shelving panels are available in packages of 12, with 24 bolts and nuts. Caster assemblies are packed four to a package.

Source for more information on this new unit may be obtained by writing to *finish*.


March · 1952
sale transit
FROM ASSEMBLY LINE TO FINAL CUSTOMER

THE ONLY SOURCE *for* ALL THESE QUALITY BOXES *and* CRATES

For Domestic or Export
For Peace or Defense

Nailed
Hinge corner
Wirebound
Cleated Plywood or Cleated Craveneer
Cleated Corrugated

(Sectional, Hinged and Watkins Types)

Our designing and testing laboratory, supervised by experienced engineers, can assist you with your packing problems, and is at your service without obligation.

A National Safe Transit Certified Laboratory

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Plants at: Helena, Arkansas • Greenville, Mississippi • Rockmart, Georgia
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safe transit

A monthly trade publication section devoted to improved packaging and shipping and materials handling practices in the home appliance and allied metal products field.

Plant experience information for all executives and plant men interested in the problem of packaging and shipping improvement and loss prevention.

Complete information on the National Safe Transit pre-shipment testing program for packaged finished products, and detailed progress reports of divisions and sub-committees of the National Safe Transit Committee.

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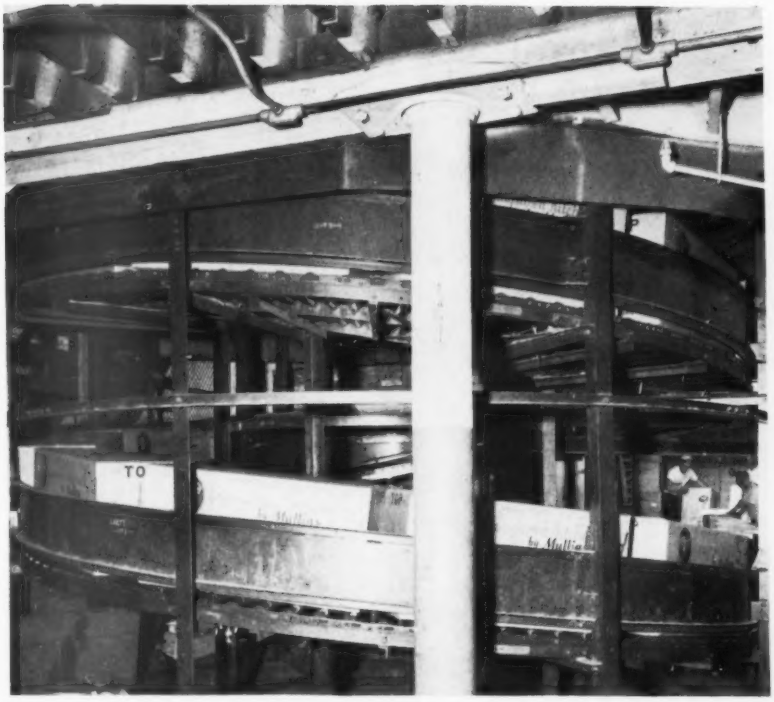
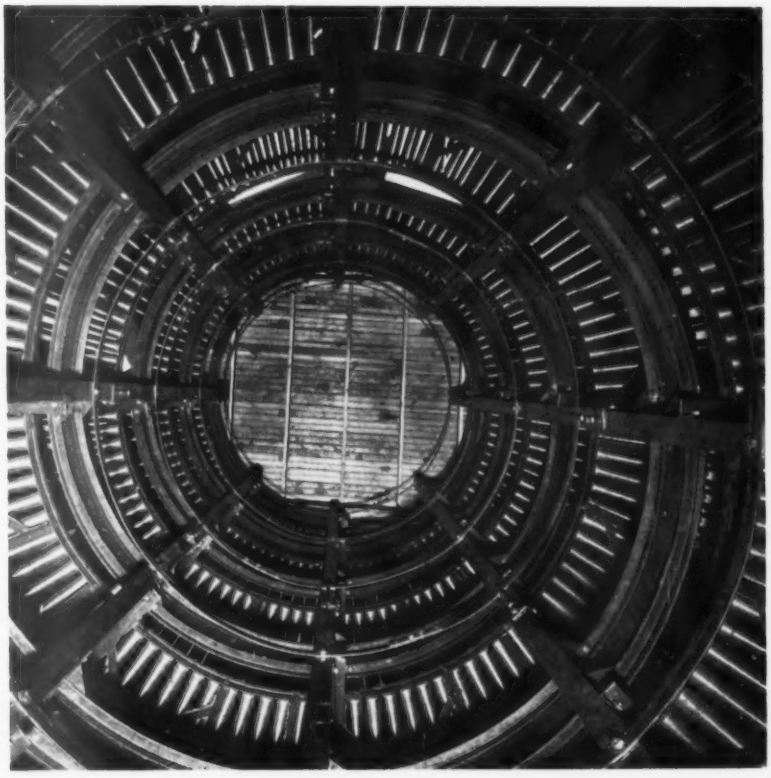


Spiral conveyor — *is used to bring packaged products down from all three floors to the shipping dock of Plant No. 3, Mullins Manufacturing Corporation, Salem, Ohio. The weight of the cartons themselves carry them down the gravity conveyor. In the lower right hand corner of above photo is shown the shipping dock. Photo below shows a view of this spiral conveyor from the ground floor looking up.*



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IN USING

BIGELOW GARVEY

COLLAPSIBLE TIGHT-CORNER CONTAINERS

Automatic washers in B-G Collapsible Hinged Crates neatly stacked in Whirlpool Corporation warehouse. Side grip lift truck operates on 800-lbs. gripping pressure.

30 YEARS EXPERIENCE

Bigelow-Garvey's many years of experience in packaging engineering assure you the right shipping container for your individual requirements.

always check

B G

General Offices and Laboratory

B-G Tight-Corner Collapsible Hinged Containers and Pallet Boxes are Profit Items for you in your shipping and handling program, when you consider the safety of your product, the time saved and the steadily rising labor costs.

- B-G Tight-Corner Containers are individually engineered to carry your product safely.
- B-G Crates and Boxes assure sharp reduction in packing time.
- B-G Containers come 65% assembled. Pre-drilled nail holes save assembly time.
- B-G Products have built-in strength. Permits heavy duty stacking.
- B-G Tight-Corner Crates and Boxes are built to withstand transit hazards. Assure safe delivery.
- B-G Containers are laboratory tested for strength. Meet National safe transit specifications.
- B-G Collapsible Containers and Pallet Boxes are the final answer to your shipping, handling and storage problems.

Let your shipping problems—whether for defense or civilian products—be ours.

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Write for complete details and prices to...

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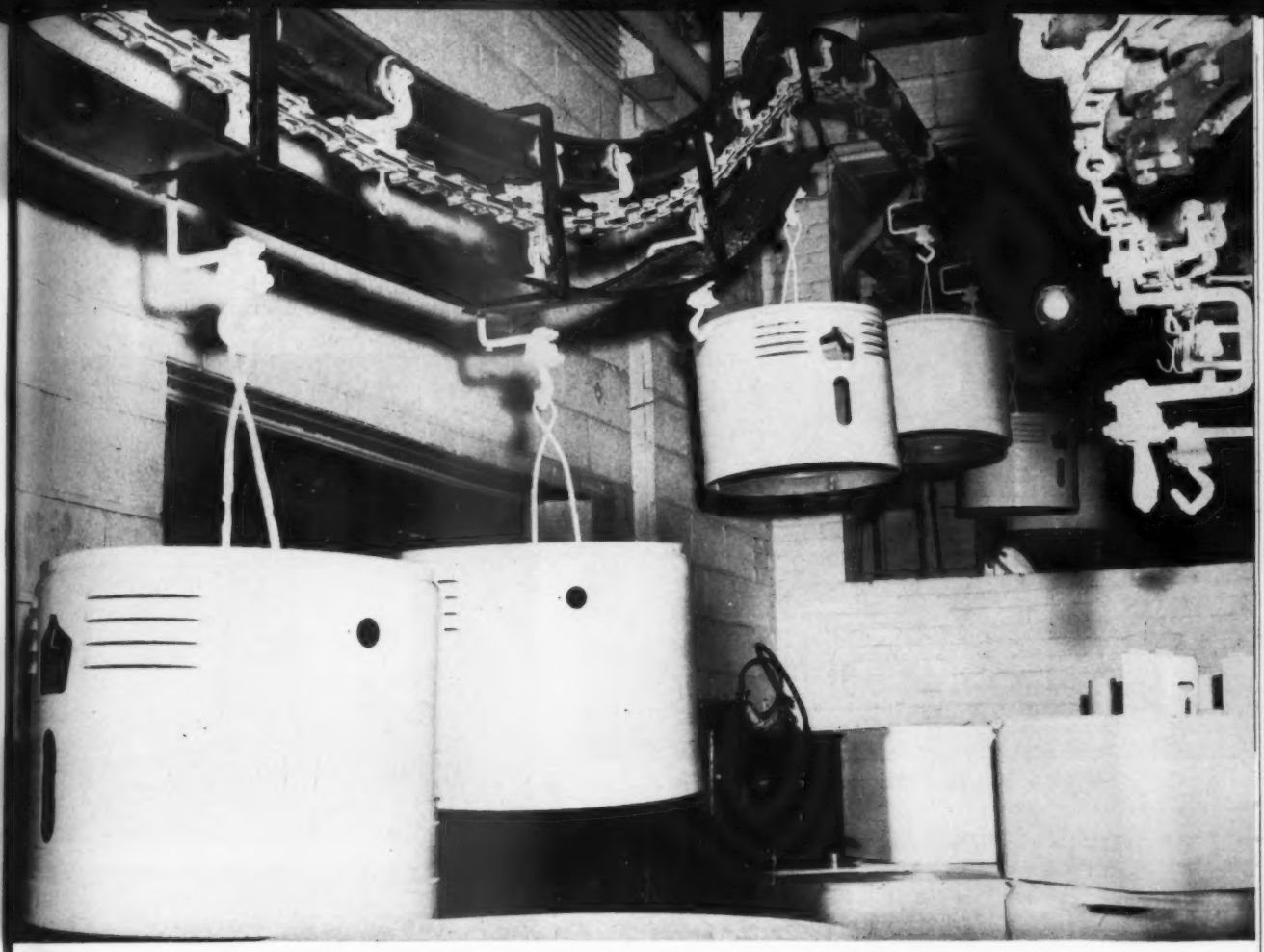
320 W. HURON STREET • CHICAGO 10, ILLINOIS



Proper packaging technique helps Apex "deliver the goods" safely

pressure-sensitive tape used to secure: washer covers, water-proof wrapping, hinged parts, protective padding, and movable parts

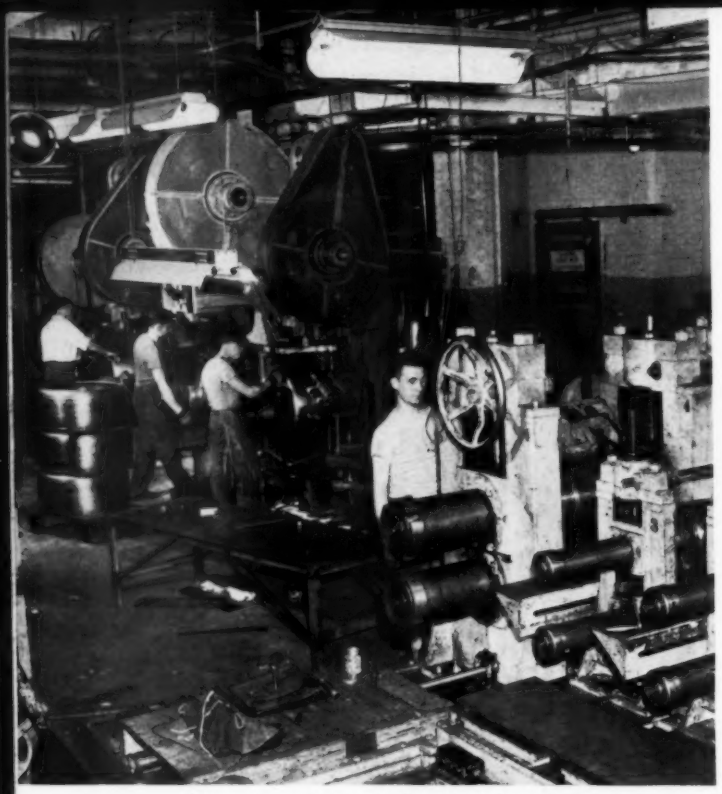
PHOTOS COURTESY INDUSTRIAL TAPE CORPORATION'S "INDUSTRIAL REVIEW"

IN the shipping department, as in other departments of any business, there is a big difference between skimping and economizing. Adequate protection for machines and appliances need not be expensive. The shipping procedures of Apex Electrical Manufacturing Company provide an impressive demonstration of the possibility of providing adequate protection *economically*.

Apex is safeguarding the appearance and performance of its appliances—and saving money in the shipping department at the same time—through the use of proper packaging techniques.

The Apex line includes every needed facility for washing and finishing the family laundry—drum type and automatic washers; portable and cabinet ironers; dryers; sink-and-washer combinations.

Each of the two Apex plants, in Cleveland and Sandusky, Ohio, is a complete, self-contained manufactur-



View of a section of the metal forming room.

ing unit, in which the production lines are highly-organized. From the initial fabrication of sheet metal on forming machines, to the testing and inspection of completed appliances, all manufacturing and assembling operations are controlled and co-ordinated to maintain maximum quality—and maximum efficiency. The appliances are built in their entirety in the Apex plants.

The shipping problem

Factory tests and inspection are commonly referred to as "final"—but this means only that appliances are certified as being mechanically perfect—and without external blemishes—*when they come from the assembly lines.* The real "final" testing occurs when machines are set up in homes, ready for use. It is then that they are judged by both their appearance and their performance. Unless manufacturing procedures are supplemented by proper pre-shipment testing procedures, damage and derangements may occur while machines are in transit. Complaints then cannot be answered by saying that equipment was in good working order when it left the factory.

Two types of protection needed

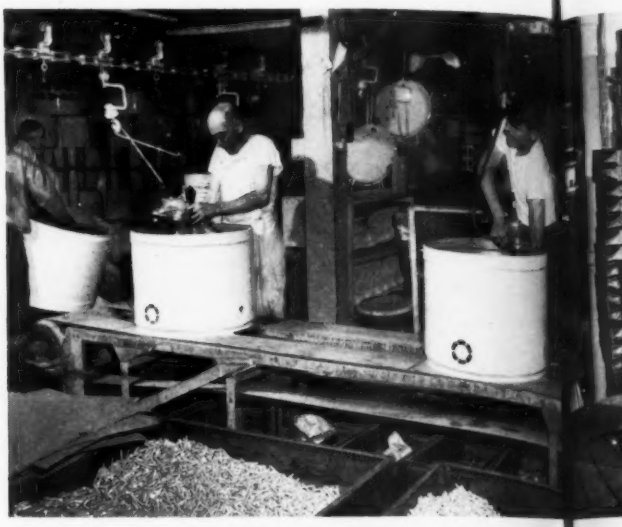
Apex appliances are typical of many that impose a special responsibility on the shipping department, as the machines require adequate protection against marring or scratching. They have loose and movable parts which require being secured firmly in position, so that they cannot be damaged by movement or displacement while in transit.

It is obviously desirable and necessary to provide the needed protection with the least possible expenditure of time, labor and materials—and to do a neat, clean job

1. On the assembly line, gear cases and motors are instal Covers are

2. Installing the agitators in the Apex conventional wash Tapes are parts, and

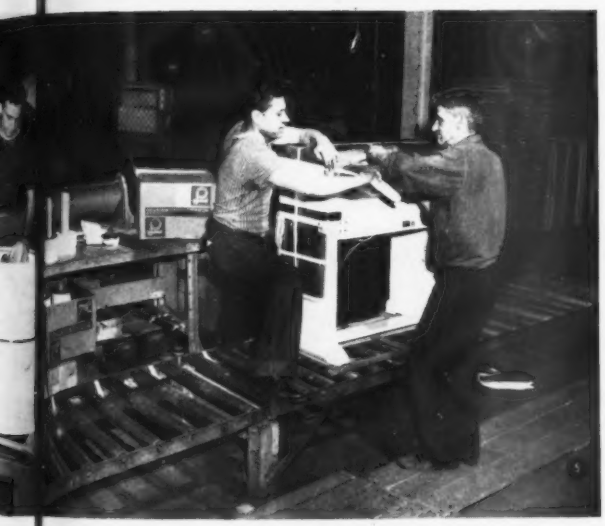
3. Final inspection and check-up are made before delivery appliances to the shipping department. Washers a



Covers are secured against movement by crossed tape bands.

Tapes are applied to ironers to prevent movement of hinged parts, and to secure protective paddings.

Washers are encased in waterproof paper before final crating.



Taped ironer is shown ready for final crating.

without mess or bother in the shipping department. It is also highly desirable to make it easy for the dealer or his customers to *unpack* machines easily and quickly—without having a mess of packing materials to clean up afterward.

In the Apex plants, stain-resistant tape is used to secure all loose and movable parts in place, and to hold and reinforce the paper battens that protect the enameled surfaces. With this tape protection, supplemented by proper crating, Apex machines are immune to the ordinary hazards of transportation, and are delivered in good order to customers.

A feature of stain-resistant tape which makes it ideal for this purpose is that it sticks immediately on contact, and sticks tight, to any part of a machine to which it is applied. This simplifies many shipping preparations that would otherwise be difficult. The taping procedure on the Apex washers is a conspicuous example.

Less work for consignees

Tapes can save time and labor in the shipping department—and they may save time and labor at the delivery end of the line. When machines are set up ready for use—in display rooms, or in the homes of purchasers—the tape and the taped battens are removed as easily as they were put on. No clean-up job is necessary, for the tape leaves no residue or stain on the white-enameled surfaces.

Similar applications of stain-resistant tapes can be employed on stoves, refrigerators, radio cabinets, files, desks and many other products that have movable parts.

Apex Electrical Manufacturing Co. is one of 94 manufacturers certified by the National Safe Transit Committee.

How the Safe Transit label is helping metal product manufacturers

over 15,000,000 labels have been used to identify pre-shipment tested packaged products

by John Oliver • SECRETARY, NATIONAL SAFE TRANSIT COMMITTEE, WASHINGTON, D. C.

"THE red and yellow Safe Transit label is proving to be of inestimable value to us in our continuing program to reduce damage loss in transit. Our records indicate that the use of the label has definitely saved us many dollars by impressing upon handling personnel the importance of better treatment of our packaged units in shipment." These are the comments of a major manufacturer of ranges who has been participating in the Safe Transit Program since its inception, and they represent the attitude of a multitude of leading firms now participating in the National Safe Transit Program.

The value which companies are placing on the NST label is best illustrated by the tremendous growth each month in the use of the label by leading companies. Since the label program was begun just two years ago, there has been a steady increase in both the number of participating firms and in total labels used, despite a decided slackening in the output of civilian products made by Safe Transit-certified firms.

15 million labels used

More than 15 million of the distinctive and colorful Safe Transit labels have been used on *packaged products* in the major appliance and allied metal product field. It is rapidly becoming the rallying flag for better shipping procedures as the label becomes increasingly familiar to all handling personnel.

A leading refrigerator firm reports: "We have been following the Safe Transit pre-shipment test procedures for more than three years, but our program was not complete until we began to use the NTS label. Now, we feel that because of the resultant benefits — improved handling and better customer relations — we can not afford to forego the use of the identifying label. Any slight application costs are many times repaid."

JOHN OLIVER

Although the National Safe Transit Program was primarily designed to reduce damage during domestic shipping, the NST label has attracted much interest even in international shipping circles. Many packaged products bearing the red and yellow label have found their way into foreign ports; there the Safe Transit label with its bold face type message — "MAKE SAFE HANDLING YOUR JOB!" — has attracted the attention of personnel completely unfamiliar with the program and has been responible for inquiries from the West Indies, Africa, England and other far-off places. Their letters confirm a long standing need for the pre-shipment testing standards established by the National Safe Transit Committee and the label that signifies that these standards have been met.

Better handling results

There is agreement among product manufacturers, dealers, and distributors, and carrier representatives that the packaged units receive better treatment when the National Safe Transit label identifies the shipment. The label, from its position on the outside of the packaged product, calls attention to all handling personnel that the manufacturer, by pre-shipment testing, has done everything possible to assure safe arrival. The scientific tests he has followed simulate actual transit conditions and the product should arrive undamaged, provided it is given proper handling by transportation and manufacturer personnel. The label is a reminder to the carrier that it is now his responsibility to see that the proper care is taken and that the product is handled in a normal manner.

Evidence that the label is commanding full attention is exemplified by the railroads' continuing program to acquaint their personnel with the label and the program for which it stands. The Association of American Railroads, for example, has publicized the Safe Transit Program in a multiplicity of ways to its handling personnel, as have many individual railroads. AAR has recently prepared and distributed several thousand posters for erection at freight houses and handling points, calling attention to the label. The poster reminds the shipping employees to "Learn to rec-

ognize these requests" and "comply with our patrons' wishes," and again quoting from the label, "MAKE SAFE HANDLING YOUR JOB!"

Similarly, the trucking industry has sent special bulletins to its people and written specific trade journal articles calling attention to the Safe Transit label. A recent bulletin from the American Trucking Association's National Freight Claims Council to its membership pictured the label and urged careful handling.

The airlines and Railway Express in the same manner have emphasized the label to their representatives through various educational means.

Improved customer relations

The Safe Transit label is being used by many manufacturers as a good will builder with their dealers, distributors and retail outlets. The label emphasizes that the manufacturer is directly interested in delivering an undamaged product to its final destination, and it further identifies the shipper as one who is doing everything possible to assure its safe arrival. The label assures all concerned that the latest scientific testing methods are being utilized, and knowledge of this cannot fail to impress the recipient of the packaged units.

There is real sales appeal in the Safe Transit label and the manufacturers' participation in the program. More and more certified companies are recognizing this and integrating the symbol into their sales' presentations and customer-relations activities. Through articles in industry publications and house organs, and letters from company officials, they are calling attention to their certification and use of the label, thus making Safe Transit an important part of both the company's sales program and public relations program.

Government interest

Added emphasis to the Safe Transit program and the allied label activities is resulting from the interest of several branches of the Government services in Safe Transit. *These agencies are considering Safe Transit as an addition to their present purchasing specifications for major appliance and allied metal products.* While the label will not necessarily be required by the services, Government officials, nevertheless, have indicated that the label would undoubtedly be a favorable factor for use by companies supplying products under these specifications.

Use of label is voluntary

The use of the Safe Transit label is restricted to companies that have been certified under the National Safe Transit Program. Upon certification, the companies are granted permission to publicize their participation in this industry-wide cooperative effort, and they are allowed to *identify their packaged products meeting the Safe Transit requirements* with the red and yellow label. Like the program, the use of the label is voluntary and whether it is used is left entirely up to the manufacturer.

The growing enthusiasm for the label as an integral part of the program indicates that practically all companies that become certified are desirous of using this mark of identification. As more leading names in the major appliance and allied metal field affix the label to their packaged units, and as handling personnel become more and more familiar with the emblem, benefits will accrue to all.

For a listing of manufacturers certified by the National Safe Transit Committee, turn to Page ST-16.

The Association of American Railroads is telling the story of Safe Transit labels (and car placards) to freight handlers, including service employees, throughout the country, with the aid of two-color posters of this type. Other carriers are carrying on similar educational programs.

PACKAGING, HANDLING ENGRS. SHOW IN CHICAGO, OCT. 14-16

The Society of Industrial Packaging and Materials Handling Engineers has announced that their 7th annual exposition will be held at the Coliseum, Chicago, October 14, 15 and 16.

Concurrently, a "short course" educational program will be conducted by the Mechanical Engineering Department of the University of Illinois, College of Engineering, Extension Division. Prof. N. A. Parker, head of the department; S. C. Robinson, assistant dean, and R. K. Newton, Extension Division, will arrange the "short course" program.

Further information on the Exposition is available from SIPMHE offices located at 20 W. Jackson Blvd. Chicago 4, Illinois.

WOODEN BOX ASSN. HOLDS ANNUAL MEETING IN NEW ORLEANS

Discussions with Department of Defense officers and representatives from operator-contractor managed ordnance plants regarding procurement and production of nailed wooden boxes and election of Association officers, were highlights of the National Wooden Box Association's 53rd annual meeting held in New Orleans, January 31 and February 1.

D. A. MC NEILL, ASSN. PRESIDENT

The year's requirements, beginning July 1, for ammunition boxes were estimated at 500 million board feet exclusive of small arms boxes. This total, it was pointed out, will require nearly one and one-half percent of the nation's entire lumber output based on a 35-billion-foot total.

Lt. Col. Gerard W. Mulder, chief of the materiel division, Ordnance Ammunition Center, Joliet, Illinois, led the panel of government and civilian ordnance plant representatives. Also on the panel were Leslie C. Reed, National Gypsum Company, Parsons, Kansas; R. E. Fike, Silas Mason Co., Cornhusker Ordnance Plant, Grand Island, Neb.; R. F. Wolfe, National Gypsum Co., Nebraska Ordnance Plant, Wahoo, Neb.; R. L. Storer, C. G. Applegate, and Ken C. Macy, all of Ordnance Ammunition Center, Joliet; Elmer A. Kruse, St. Louis Ordnance District, St. Louis; L. Charles Tienken and Otto O. Brown, both of Remington Arms, Lake City Arsenal, Independence,

IF YOU HAVE DEFENSE CONTRACTS—

—WE CAN FURNISH YOUR SHIPPING CONTAINERS

You can be sure that SUPERSTRONG boxes and crates will fully comply with Government packaging specifications. Our facilities and equipment, our nearly a century of experience, our control and supply of raw materials, are your assurance of obtaining containers manufactured in accordance with the following Government specifications —

SHIPPING SUPERSTRONG CONTAINERS

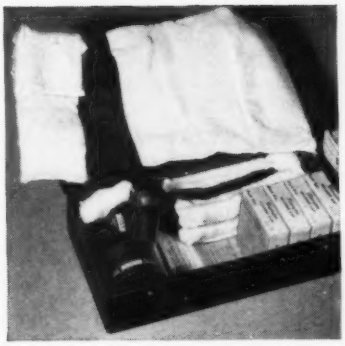
WIREBOUND BOXES and CRATES
WOODEN BOXES and CRATES
CORRUGATED FIBRE BOXES
BEVERAGE CASES
PACKING TRAYS . . . PALLETS

JAN-P-106A	Wood Export
MIL-B-107A	Wirebound Export
NN-B-621b	Wood Domestic
NN-B-631c	Wirebound Domestic
NN-B-601b	Cleated Plywood-Domestic
JAN-P-105A	Cleated Plywood-Export
LLL-B-631c	Fibre Corrugated-Domestic
NN-B-591a	Fiberboard, Wood, Cleated
MIL-B-2427	Wood Ammunition Boxes
JAN-P-132	Wood Crates-Unsheathed
MIL-C-11133	Wirebound Crates-Domestic (QMC)

RATHBORNE, HAIR AND RIDGWAY BOX CO.
1440 WEST 21st PLACE • CHICAGO 8, ILLINOIS
EASTERN SALES OFFICE • 121 NO. BROAD STREET, PHILADELPHIA 7, PA.

Kimpak Float Packaging*

Kimpak surface protection of General Electric Diesel locomotive



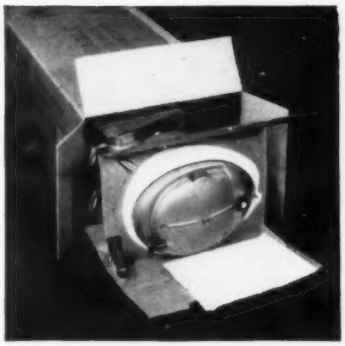
Fluoretor, a product of Menlo Research Laboratories, Menlo Park, California.

From delicate instruments to giant Diesel locomotives—maximum protection at lowest true cost!

In the world's largest shipping package a 231-ton Diesel-electric locomotive is assured of the finest surface protection. It's protected for a damage-free trip overseas by soft, strong, shock-absorbent KIMPAK* creped wadding. And KIMPAK affords equal shipping protection to instruments, furniture, flowers, food and even precious liquids in delicate glass vials. For KIMPAK is designed to defend your product against all kinds of shipping hazards—from vibration, shock, pressure marking, rubbing, scratching.

KIMPAK comes in rolls or sheets—in a wide range of guaranteed thicknesses and specifications to cover all Four Basic Methods of Interior Packaging: Surface Protection, Blocking and Bracing, Flotation, and Absorbent Packaging. So easy to apply, it saves literally hours in the shipping room. So clean, soft and non-abrasive, it serves to "dress up" a package, as well as to reduce damage in transit.

Try KIMPAK soon. You'll find it not only cuts your shipping costs, but provides "float packaging"—the world's most effective shipping protection. See your nearest KIMPAK distributor listed in the classified telephone directory under "Packing Materials" or "Packing Materials—Shipping"; or write to Kimberly-Clark Corporation, Neenah, Wis.



Outboard motor, manufactured by Johnson Motors, Waukegan, Illinois.

FREE BOOKLET!

KIMBERLY-CLARK CORPORATION
Neenah, Wisconsin F-352
Please send me free, the illustrated KIMPAK booklet, "Float Packaging."

Name _____

Firm _____

Address _____

City, Zone, State _____

Kimpak

A Kimberly-Clark Cellulose Wadding Product

REG. U.S. PAT. OFF. & FOREIGN COUNTRIES

PROTECTIVE CUSHIONING

*T. M. REG. U. S. PAT. OFF.

ST-11

Mo.; and Lt. A. J. Kaufman, Lake City Arsenal.

H. H. Pein, Pein Box Company Oregon, Ltd., Portland, presided over the sessions until the election of his successor, D. A. McNeill, Jr., of McNeill, Lauff & McNeill, Thomson, Georgia, new Association president. McNeill is president of his firm, and he is past president of Southeastern Box & Shook Manufacturers Association.

Reelected were executive vice president C. D. Hudson, Washington, D. C., and treasurer P. John Galbraith, John Galbraith, Philadelphia, Pa.

Member manufacturers from all producing areas in the country were represented at the meeting. H. C. Berckes, secretary-manager, Southern Pine Association, New Orleans, gave the address of welcome. Others on the program included Stanley A. Craven, Chief, Wooden Containers Section, OPS Lumber and Wood Products Division; Arthur D. Zachary, Section Chief, Wooden Containers Section, NPA Containers and Packaging Division; and David D. Fairbrother, consultant, all from Washington.

During the business session members approved a continuing and vigorous trade promotion program reflecting the recommendation of retiring president, H. H. Pein who, in his address, listed trade promotion as one of the Association's primary purposes.

Other fundamental association purposes, according to Pein are the "Improvement of our products by the open interchange of methods and ideas and encouragement of sound and ethical business practices." In discussing the latter purpose which Mr. Pein described as a pledge rather than a program, he said, "Not only is it important but it has the additional advantage of being inexpensive."

KIMBERLY-CLARK NAMES DISTRICT SALES MANAGERS

A. G. Sharp, general sales manager, Kimberly-Clark Corporation, Neenah, Wisc., has announced the following personnel appointments:

R. N. DeWilde, formerly Kimpak sales representative in southern California, district sales manager, industrial cellulose wadding products, with headquarters in New York; Douglas G. Berry, formerly sales service, Neenah, district sales manager, building products division, with headquarters in Chicago.

R. N. DEWILDE D. G. BERRY

AMERICAN BOX WINS SECOND OHIO SAFETY AWARD

For the second consecutive year, the title "Safest Woodworking Plant in Ohio" was awarded to The American Box Co., Cleveland, at the 21st annual Greater Cleveland Industrial Safety Campaign banquet. The Safety Award, a yearly citation approved by the Industrial Commission of Ohio, and the Greater Cleveland Safety Council, was presented to Henry S. Kubes (left in photo), vice president and general manager of American Box. Edward A. Kubes, production superintendent, is shown on the right.

PACKAGING EXPOSITION OPENS IN ATLANTIC CITY, APRIL 1

The 21st National Packaging Exposition, and concurrent Conference on Packaging, Packing and Shipping, will be held in Atlantic City, N.J., April 1-4. It is sponsored by the American Management Association.

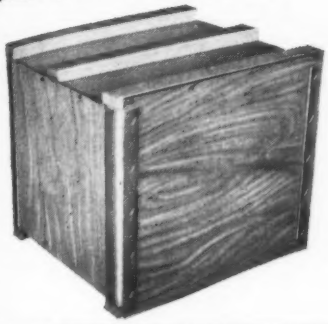
PHILADELPHIA PACKAGING ENGINEERS ELECT OFFICERS

At the January 28 meeting of the Philadelphia regional division of the Society of Industrial Packaging and Materials Handling Engineers, the following officers were elected for the current year:

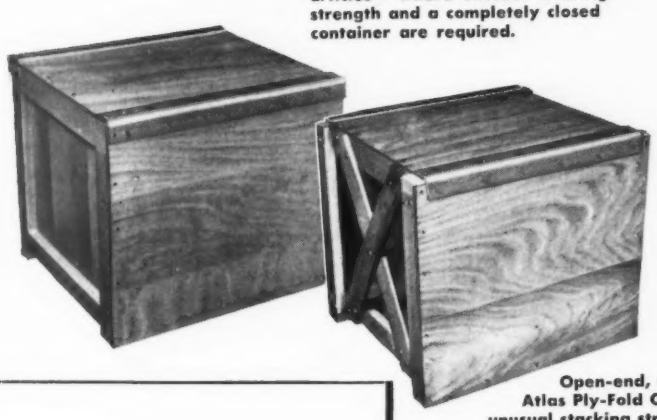
President, Theodore Clattenburg, U. S. Army, Signal Corps; exec. vice pres., W. E. Soden, Sun Oil Company; vice pres., A. O. Manger, Rathborne, Hair & Ridgway Box Co.; vice pres., Henry French; treasurer, F. D. Edwards, Potts-Farrington Co.; and secretary, R. F. Tettemer, H. G. Hanline Co.

Following the election of officers a movie on materials handling was shown. Developed by Electric Storage Battery Co., the film demonstrated the effectiveness of modern mechanized equipment as compared to old-fashioned hand labor.

The original, and standard, Atlas Ply-Fold Crate. Many thousands have been used for shipping air conditioners, stoves, desks, compressors, washing machines, etc.



Four-piece Atlas Ply-Fold Crate, designed for the shipping of heavy articles—where unusual stacking strength and a completely closed container are required.



Open-end, four-piece Atlas Ply-Fold Crate, with unusual stacking strength and serviceability—for use wherever completely enclosed containers are not required.

One of these four
ATLAS "PLY-FOLD" CRATES

provides exactly the shipping protection *your product* requires

Atlas Ply-Fold Crate, similar to that at the left. However, this container is fitted wih backbars for the shipment of articles requiring backbar assembly.

It is our privilege to supply plywood containers to the leaders of a great many industries—for the domestic or export shipment of a very wide range of products. Some are light, some are heavy; some are small, some are very large.

Four of the most important types of Atlas Plywood Crates are pictured above. Each of these is delivered with the components partially assembled—which means ease and economy in assembly. All feature light-weight construction, minimum displacement, minimum container cost, minimum shipping cost.

For the past 22 years we have maintained—in Lawrence, Massachusetts—what is probably the most complete Container Laboratory in this country. Every possible test for stress, strain, durability, weight and final cost is constantly applied to assure the safe delivery of your product. Periodically this Laboratory tests selected samples of all containers made for each customer in any of our plants. Here is complete Quality Control on your containers *at no extra cost.*

We invite the opportunity to discuss your needs for plywood containers or crates—in any quantity, large or small—on any schedule, delivered anywhere. Kindly address your letter to Department 55.

AMERICAN MANAGEMENT ASSOCIATION
21ST NATIONAL PACKAGING EXPOSITION
ATLANTIC CITY • April 1-4 1952

MANUFACTURING PLANTS

Richford, Vt. — Plymouth, N. C.
Morrisville, Vt. — Williamston, N. C.
Greenville, Me. — Munising, Mich.
Howland, Me. — Newberry, Mich.
Houlton, Me. — Grayling, Mich.
Patten, Me. — Rhinelander, Wisc.

DISTRIBUTING PLANTS

Lawrence, Mass. — Phillipsdale, R. I.
Southbridge, Mass. — Camden, Ohio

CONTAINER DIVISION

ATLAS
PLYWOOD CORPORATION

SALES-SERVICE OFFICES

Boston, Mass. — Pittsburgh, Pa.
New York, N. Y. — Springfield, Ohio
Chicago, Ill. — Cleveland, Ohio
Dayton, Ohio — Goldsboro, N. C.
Evansville, Ind. — Gladstone, Mich.

DISTRIBUTING PLANTS

Passaic, N. J. — Oneida, N. Y.
Evansville, Ind. — Lockport, N. Y.

STATLER BUILDING, BOSTON 16, MASS. • Telephone: Hancock 6-0016 • Teletype: BS-644

3M NAMES BORDEN, WEYAND

Minnesota Mining & Manufacturing Co. has announced the promotion of Louis F. Weyand, of Detroit, a vice president and board member, to executive vice president. Weyand will head a new tape group coordinating operations of the firm's cellophane, industrial, masking, gummed paper, electrical and sound recording tape divisions.

It was also announced that John A. Borden, general manager of the cellophane tape division, has been named sales and marketing consultant for all 3M tapes.

GENERAL BOX OPEN HOUSE FOR NEW OFFICES, LABORATORY

At an open house for more than 250 guests, General Box Company formally opened their new executive offices and laboratory in Des Plaines, Illinois. Of major interest to those in attendance, including many leading packaging authorities, were the new laboratory facilities available for designing and testing all types of shipping containers.

The laboratory occupies over 10,000 sq. ft. of well-lighted space. It is divided into four separate sections; one contains testing equipment; another is used for the manufacture of sample boxes; the third contains a research operation; the fourth is devoted to design and creation of boxes.

In the testing section, two revolving testing drums simulate the rough handling a package receives in transit. The smaller, a 7-footer, takes packages up to 20″ long and 250 lbs. in weight. The other, a 14-foot unit weighing over 27,000 pounds, is set in a special pit to make it easier to load and unload. It will tumble packages 6′ long, and 300 lbs. in weight. Included are a Conbur tester, drop tests, vibrator, compression tester, etc.

A room devoted exclusively to testing corrugated and solid fibre board boxes controls uniformity by careful control of temperature and humidity. This room also contains a battery of testing devices to determine fibre board performance characteristics.

N. A. Fowler, vice president and director of sales and research, directs the laboratory activities. John Ladd is manager of the designing and testing section, and J. Don Elston is manager of the research division.

finishfotos

Above: Some of the guests who attended the General Box open house. Below: General Box office girls are shown in front of the laboratory's new 14-foot revolving drum tester.

NST MAIL BAG

labels in West Indies

NST Committee:

On a recent trip through the West Indies, I noticed several of your red and yellow labels entitled "Pre-Tested Safe Transit Shipment."

Do you have any booklet or other descriptive literature explaining your pre-testing standards.

C. W. Batkay
Export Division
Fairbanks, Morse & Co., Inc.
New York, New York

packing costs reduced 20 to 30% in Switzerland

NST Committee:

With great interest we are following the development of your test procedures of which we are informed through *finish* and the articles issued by the Enamelling Institute. Your standard testing equipment for smaller parcels has been in operation for some time in our plant, and the result is that some of our packing costs have been reduced from 20 to 30%.

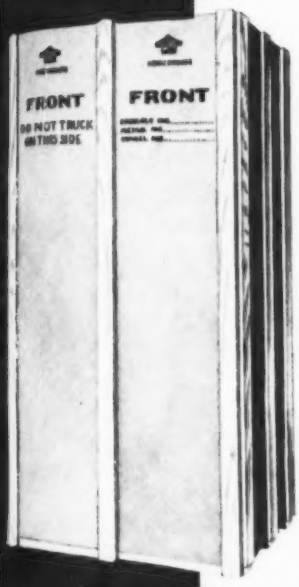
At the present time we are installing a Conbur incline testing device and a vibration testing machine according to your standards.

Therma Electric Heating
Mfg. Co., Ltd.
Schwanden, Switzerland

WATKINS

cleated corrugated containers

For Better • Safer • Shipping

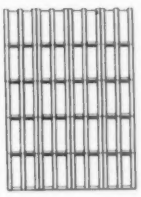


When choosing your product shipping containers, think of the scientifically-designed Watkins Containers which provide *complete* protection.

Your product will arrive at its destination SAFE and CLEAN, and the smooth, staple-free interior protects fine product finishes.

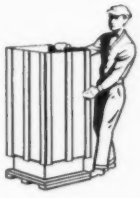
The 75% assembled containers reduce assembly time to a minimum, saving valuable man-hours.

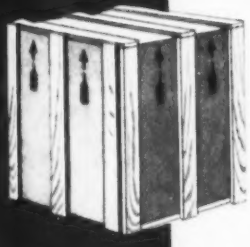
The "Traveling Billboard" feature of Watkins Containers is an extra feature. Your advertising message can be printed in two colors on all sides. Ship and Advertise the "Watkins Way."

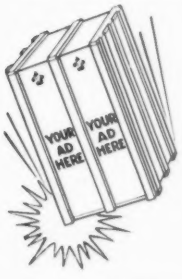


STACKING Vertical wood cleats provide EXCEPTIONAL SUPPORTING STRENGTH to carry heavy loads. Typical crate supports 4 tons.

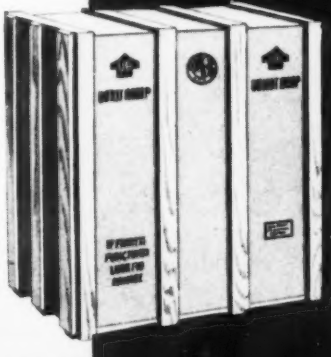
QUICK Assembly line packing is speeded up. EASY TO HANDLE. *Complete* protection for your product.



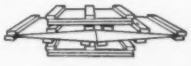




STRONG All wood cleats securely glued to tube-mat. Laboratory tests prove glued cleats RESIST WEAVE AND DISTORTION BETTER.



STORING Containers are delivered flat (only 3 sections) and closely nested to CONSERVE STORAGE SPACE.



THERE IS A
WATKINS CONTAINER
MADE NEAR YOU

These companies build WATKINS containers

CORNELL PAPERBOARD PRODUCTS CO.	1514 E. Thomas Ave., Milwaukee, Wis.
COZIER CONTAINER CORP.	446 East 131st Street, Cleveland, Ohio
CRATE-RITE MFG. CORP., Division of Pacific Ports Ind. Inc.	10901 Russet Street, Oakland, California
DURA-CRATES, INC.	940 East Michigan Street, Indianapolis, Indiana
GENERAL BOX CO., 1825 Miner St., Des Plaines, Illinois, and 16th and Maple Sts., Louisville, Kentucky	
HEMB & MARTIN MFG. CO.	Watseka, Illinois
ILLINOIS BOX & CRATE CO.	811 Center Street, Plainfield, Illinois
KIECKHEFER BOX & LUMBER CO.	1715 West Canal Street, Milwaukee, Wisconsin
LANE CONTAINER CORP.	10212 Denton Road, Dallas, Texas
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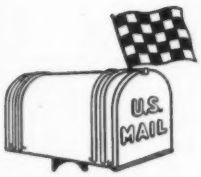


finish SUGGESTION BOX

Controlling vapor level and protecting heaters in vapor degreasing

AN arrangement of thermostatic controls will help a hot vapor degreaser operate efficiently while its heating elements are protected from destructive over-heating. Two Thermoswitch units (precision thermostats) are employed to maintain the vapor level at a safe height within the tank and prevent the heater elements from burning out.

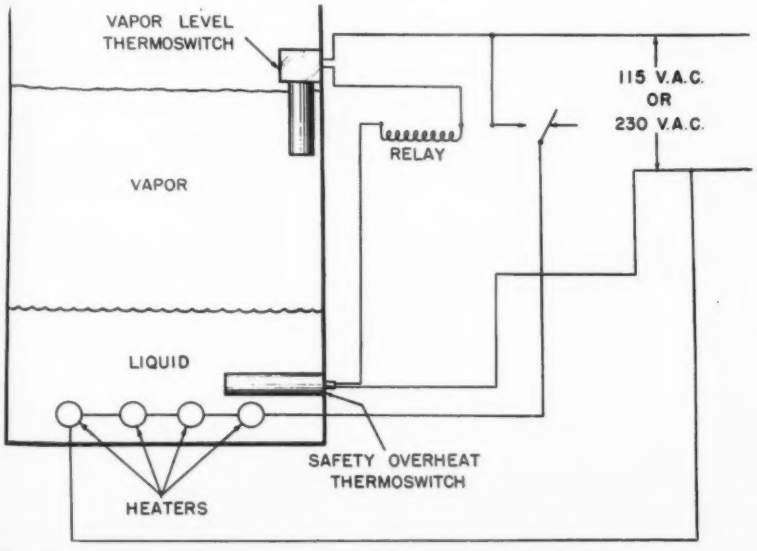
The hot (trichloroethylene or perchloroethylene) vapor, condensing on the surface of metal being cleaned, washes off the grease or grime which then collects as sludge at the bottom of the tank.

Two control problems arise in the operation of an open-top degreaser: (1) preventing the heavier-than-air vapor from overflowing the top of the tank, and (2) protecting the heater from burning out because of the insulating effects of the sludge accumulation.

To control the vapor level, a sensitive device capable of quick response is required. This response is provided by a normally-closed Thermoswitch, as the diagram shows, inside the tank at the "danger" level. The thermostat, which has a sensitivity of less than ±0.5° F. and set to function at 170° F., "senses" the hot vapor rising to its level and quickly opens the heater circuit. The heater remains off until the vapor recedes to a safe level, whereupon the thermostat, activated by the drop in temperature, again puts the heater into operation.

The heater elements at the bottom of the tank are protected from overheating and possible destruction by the action of a second, normally-closed Thermoswitch. This unit, set at 235° F., is installed adjacent to the heaters. Should the insulating action of the accumulated sludge cause the temperature to rise to 235° F., the thermostat cuts off the power to the heater circuit. After the temperature drops to a safe level, the thermostat again functions and puts the heater into operation. Thus, two precision thermostats, one operating in a liquid and the other in a vapor, combine to control and safeguard the operation of the degreaser.

Diagram shows arrangement of the two precision thermostats.



Source for more information on this protection system and parts may be obtained by writing *finish*.

UREA FORMALDEHYDE RESIN LOWERS BAKING ENAMEL COST

The cost of white baking enamels for such applications as coatings for washing machines, kitchen cabinets, and industrial equipment may be lowered and stabilized by the use of a new urea formaldehyde resin. The resin is based on propyl alcohol, which should be less subject to wide price fluctuations than the more widely used butanol.

When employed as the amine component of white industrial baking enamels, the new resin is reported to provide: fast baking with good hardness, excellent gloss and gloss retention, excellent color and color retention, excellent stability, good adhesion, and high resistance to water.

While the tolerance of the resin is somewhat lower than that of Uformite F-200E, it is said to exhibit greater mineral-thinner tolerance for xylol and toluol — conventional solvents for alkyds in enamels. The producer suggests that the material be used as 10 to 40% of the total vehicle solids, depending upon film requirements. The balance of the vehicle may be either an oxidizing or non-oxidizing alkyd.

Some of the important physical constants of the new resin are:

Solids	48-52%
Solvents	52-48%
Propyl alcohol	70%
Xylol	30%
Viscosity (as supplied)	V-Z (Gardner-Holdt)
Weight per gallon	8.5 lbs.
Mineral-thinner tolerance (minimum)	7 cc/10 g. solution
Iso-octane tolerance	6 cc/10 g. solution
Acid number (solids)	6-9
Color	clear and colorless

Write to *finish* for more complete technical details.

Curtain walls as related to porcelain enamel

(Continued from Page 22)

mended that the panels have a porcelain enamel finish.

The "sandwich panel"

The panels that we installed in the Technical Center buildings are known as "sandwich panels." The sandwich in this sense is of laminated construction utilizing a range of dissimilar materials.

A laminate is a sheet of material consisting of a multiple number of layers held together by a bonding agent or glue. The plastics industry has developed fantastic bonding agents in recent years; bonding agents that will perform unbelievable tasks. We are now able, for instance, to bond rubber to wood or metal, metal to wood, and other equally astonishing feats.

The Drake panel was a sandwich but was a sort of primitive forerunner of the panels we are now using. In that panel, the bond was around the perimeter only over an area about 4" wide. This left the center area of the skin free to move and oil-canning was the result. We now bond the skins over the entire area of the core material and the result is a perfectly flat surface.

Now let's take the sandwich apart and see how it works. World War II focused attention on sandwich construction in which a very low density core material was surfaced with skins of high density. The British, in their Mosquito bomber developed a sandwich having a core of balsa wood weighing 7 to 12 pounds per cubic foot, and skins of birch weighing about 35 pounds per cubic foot. The simple principle of separating two skins of high or relatively high density with a low density core caused a flood of publicity for sandwich construction.

The structural sandwich

The structural sandwich is a method; it is not a patented article and is not a monopoly. Anyone or any manufacturer can use sandwich construction. Many are doing so today. One of the most common items which utilizes sandwich construction is the door. Flush-type doors are now being manufactured by several sandwich methods. The sandwich method is an efficient means of obtaining a desired degree of stiffness or rigidity with a minimum of weight and without sacrificing strength. If one attempts to bend a sandwich, I mean a real sandwich of the eating variety, the concave slice of bread stretches and pulls apart while the convex slice is compressed and will not break until the ham or cheese has broken. Now try to bend a "Dagwood" sandwich in which the core is several times thicker than the bread. It can be done, of course, but it is far more difficult than the thin sandwich and actually the "Dagwood" won't bend in the sense to which I refer. This is the basic principle of the sandwich construction: First, make a sandwich of a thin slice of wood covered with two thin slices of aluminum. It bends easily. Substitute a thicker core of any light weight wood and it becomes more difficult to bend the sandwich. Therefore if the sandwich is not stiff enough for the job and bends too easily, you simply separate the surfaces by a greater distance.

Construction progress photo showing glass and panels in place in curtain wall of Drake University's Pharmacy Building.

The function of the core

The ability of the panel to resist bending is, of course, dependent upon the elasticity of the material constituting the outside surface of the panel. Therefore we could do away with all material in the middle of the panel if we could find some means of holding the surfaces apart a chosen distance and could keep either from shifting position with respect to the other. Since we cannot do this we substitute a relatively low strength, very light weight material for the material we wish to throw away. All this material has to do is to separate the two surfaces or skins the desired distance and keep them from shifting position. The strength required to do this is relatively very low so the material in the center or core can be proportionately weak and light in weight. Most of the strength has to be in the skin.

Therefore, a structural sandwich can be defined as a product having thin, dense, high strength faces separated and stabilized by a thick, light weight, relatively weak core.

The honeycomb core

Usually ideas come more rapidly when a need exists. This need existed in World War II and the honeycomb core was born. The honeycomb principle reduced the core to a minimum and retained all the necessary strength requirements. Several firms developed honeycomb materials made of plastic impregnated papers and cotton fabric. Today honeycomb is also made of aluminum foil. Honeycomb is the ideal core material. It has one handicap—it is not fireproof. So when the building codes or fire hazard prevents the use of honeycomb we must substitute a heavier fireproof core. Fortunately we have materials that we can substitute.

A challenge to the enameling industry

I believe that our office is a pioneer in the use of the sandwich panel in building construction. I believe also that we were the first architects to utilize porcelain enamel skins. When we proposed porcelain enamel sandwiches on the Technical Center project our troubles began. Our next step was to find a manufacturer who would do the job. Our first efforts were not encouraging.

We were told that porcelain enamel is so similar to glass that it was not possible to bond it permanently to a core. One manufacturer was willing to try, however, so we ordered sample porcelain skins from a local Detroit enameler. When the skins were ready the manufacturer who was to fabricate the panels backed out. We found ourselves with porcelain enamel skins but no sandwich. We turned to a third manufacturer who had never seen porcelain enamel used in this way but was willing to try. The results were very encouraging. Those first panels were installed in a full size exterior mockup that was built at the General Motors proving ground. They have been in place for over two years.

Let us now discuss the part the porcelain enameling industry must take in the development of porcelain enamel sandwich panels. The industry has a job to do. If the challenge is accepted, I can see a good future for this product. It has limitations. If you do not recognize these limitations and proceed in the all too frequent American way of capitalizing on and commercializing an idea it will have a very short life. We have learned from our own experience.

A three point requirement

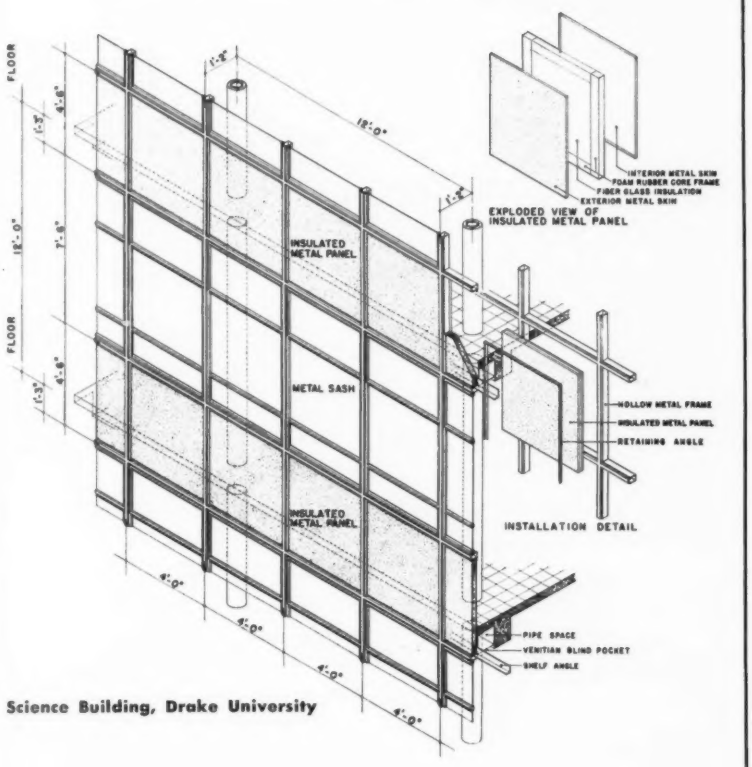
These are the conclusions we have reached:

1. The panels are exposed to the elements which will find any errors you make. They will find them in a hurry. Therefore don't take chances—use the best materials and the most rigid inspection.

2. Never use lighter than 18 gauge metal.

3. Strive for the highest quality possible in all respects.

Typical Detail of Exterior Curtain Wall



Science Building, Drake University

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From the Editor's mail..

→ *from Page 12*

ago in some national publications. I know what this means to your readers, to your advertisers, and last but not least to you.

George S. Blome
Baltimore, Maryland

thank you, Mr. Blome. As a reader of *finish* since its inception, your views are doubly important to us.

Vibration and drop tests

Gentlemen:

The article in January 1952 issue of *finish* on "A Deluxe Model Incline Impact Tester" is very interesting and helpful in setting up a product testing program.

This program, however, would be incomplete unless vibration and drop tests are included in evaluating results of container and contents undergoing simulated hazards in handling and transportation.

Therefore, I would be very grateful to know if construction details of a vibrating machine and drop table and their use are available.

M. Doglio
Production Methods Section
A. D. T. Company, Inc.
New York, New York

in agreement with your letter, it is indicated in the requirements of National Safe Transit pre-shipment testing plan, which calls for Conbur, vibration and drop test equipment, plus instrumentation. Vibration equipment may be purchased from L.A.B. Corporation, Summit, N.J., and J. Frank Seely & Son, Scranton, Pa., and drop test equipment from Acme Steel Company, Chicago.